COAL AGE

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MINING AND METALLURGICAL INVESTIGATIONS

UNDER AUSPICES OF

CARNEGIE INSTITUTE OF TECHNOLOGY,
UNITED STATES BUREAU OF MINES, AND
MINING AND METALLURGICAL ADVISORY BOARDS.

MINE-CAR FRICTION WITH SIX TYPES OF TRUCKS

By

M. D. HERSEY, *Physicist, and* P. L. GOLDEN, *Aide,*
U. S. Bureau of Mines;

and

HENRY SHORE *and* M. S. DOWNES, *Research Fellows.*
Carnegie Institute of Technology.

The tapered roller bearing truck appeared to have the least friction of any . . .

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CARNEGIE INSTITUTE OF TECHNOLOGY,
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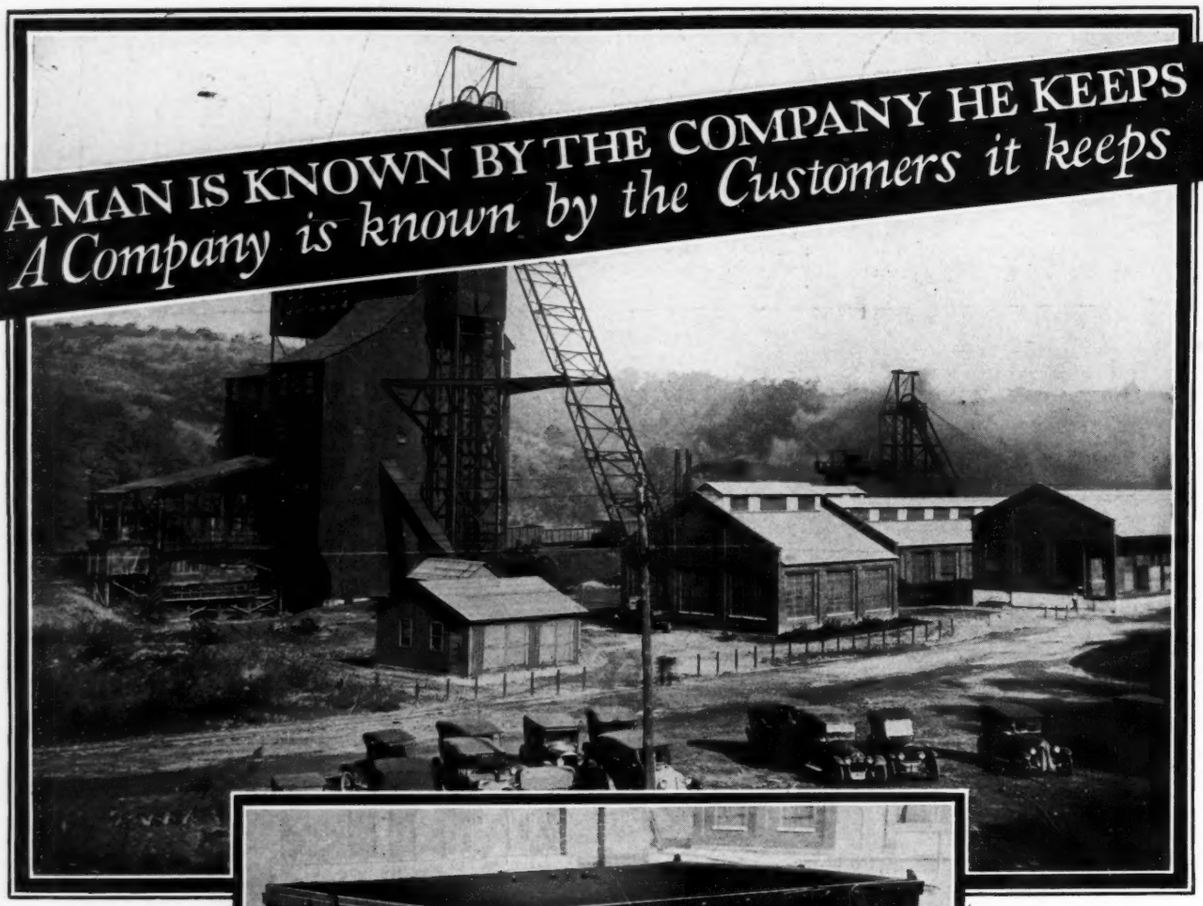

THE Inland Collieries Company tipple at Indianola, Pennsylvania, and one of the three hundred Hockensmith cars built to their specifications. These cars daily handle 2500 tons of coal, on an average haul of 1½ miles. The company reports them as "....well built....sturdy ....have withstood a lot of hard usage."

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Devoted to the Operating, Technical and Business Problems of the Coal-Mining Industry

Volume 30 — New York, November 18, 1926 — *Number* 21

COAL AGE

With which is consolidated "The Colliery Engineer" and "Mines and Minerals"
R. DAWSON HALL, *Engineering Editor*

Conventions of Importance

This appears to be the open season for conventions. Out in the Middle West last week the Illinois Mining Institute met and discussed some of the problems that vex the industry in that region. This week, at the Carnegie Institute of Technology, in Pittsburgh, a notable conference to consider ways and means of utilizing bituminous coal to better advantage than it is used at present is being held. Scientists from all of the more important producing countries will take part in the discussions and the possibilities involved are well-nigh limitless.

No Solution Yet At Hand

For many years bituminous coal men have sought some practical means of rendering their output smokeless while simultaneously recovering the valuable byproducts contained in the raw material. Much experimental work has been done, but so far if any thoroughly practical method has been devised few people know about it. The basic idea behind this conference is that thoughts may be brought out that will prove of value in finding a practical solution to this baffling problem.

Naturally *Coal Age* will "be on the job." Not only will the meeting itself be "reported" but some of the papers also will be printed practically in full. Others, however, being of a highly technical (chemical) nature, will be given only by abstract or synopsis.

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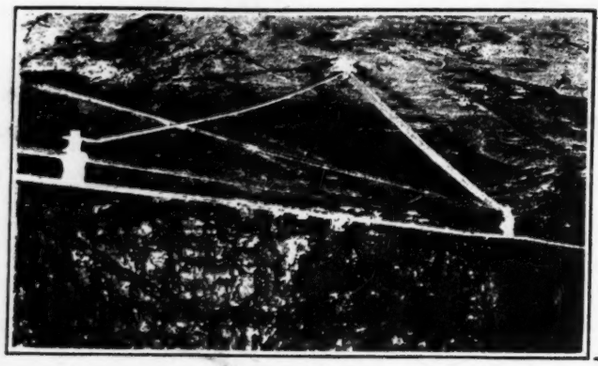

Support for High Place

Here a 500,000-circ.mil feeder and the trolley are supported by a strap-type extension To adjust the wire to exact height the clamps are spread apart or moved closer together, and the strap bent by hand to conform to their positions.

the wire. In many instances after a fall the wire can be brought back to height by loosening and re-adjusting the clamps

sidered good practice in any case to have the arc of cor pulley less th

few in

Supports Trolley and Feeder At Desired Height

As it is ordinarily done, to hang trolley wire a uniform distance above the rail where the mine roof varies in height is difficult and expensive. This is because it requires cutting extension rods or pipe to exact length on the job. This difficulty is eliminated by a method that has been inaugurated at several mines of the West Virginia Coal & Coke Co.

In the accompanying illustration may be seen an extension of the type used in the No. 4 mine at Omar. Here a 500,000-cir.mil feeder and a 4/0 trolley are supported by the new method. The height variation is secured by bending the ¼x1¼-in. strap iron to the desired angle and sliding the clamps to the correct spacing on the wire before tightening.

COAL AGE

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Devoted to the Operating, Technical and Business Problems of the Coal-Mining Industry

R. DAWSON HALL
Engineering Editor

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The Penalty of Postponing

NO POLICY CONTRIBUTES MORE to the achievement of low-cost production of coal than that characterized by the motto, "Do it now." Its function is analogous to that of a governor on an engine. Whereas the governor controls the speed of the machine so that it will not exceed a certain maximum, this policy by the same token regulates cost. Extending the comparison a little farther, both serve to promote uniformity of expenditure over long periods—the one of power and the other of money.

Action should be taken not tomorrow but immediately when the need for execution of certain repair or construction jobs is realized, or the want felt for new equipment to replace old, or to supplement that which is in use. Delay is costly and frequently dangerous.

The longer maintenance jobs are put off the more are they likely to cost. The expense incurred in remedying a stretch of bad roof increases progressively with the period of delay. Taking down a few tons of rock and setting a few timbers often check further loosening of the roof strata and may prevent a serious accident. Replacing faulty bearings at the proper time may save a shaft. Repairing a piece of crooked track will prevent derailments and also increase the speed of haulage. The cost of maintaining a worn-out piece of equipment in many cases is enough to pay for a new unit. Inadequacy of mechanical facilities either curtails production or increases labor cost. The effects of all these factors on production are measurable in dollars and cents.

That only those companies that keep their plants in good shape at all times are really successful is a significant fact. Prompt action when need arises subtracts from the cost of production whereas delay adds to it. It is profitable, therefore, when something needs doing, to "do it now."

Well Made But Not Well Sold

MANY A MANUFACTURER expends his effort in making a good product and trusts blindly to luck to sell it. This is as true of intangible products as of those which are more concrete. The U. S. Bureau of Mines is developing new ideas as a result of its investigations, but what good can and may they be to any one if they are allowed to clutter up the offices at Washington and the stations throughout the country and are not distributed to the consumer?

If they are not to be an economic waste, they must be "sold" to the mining community, using the word "sold" in its latest sense. But for this there must be some equivalent to a selling appropriation. This year the Bureau has only $2,000 for the expense connected with the reading of papers at conventions which is only $100 roughly for each major division of its activities.

As a result, at the meeting of the National Safety Council, where its members presented three official and one unofficial paper, only one representative of the Bureau was present to "sell" the most important product of that organization—safety—in one of the best markets that can be found anywhere. One of the papers was by S. H. Katz on the filtering efficiencies of dust respirators and gas masks, the outcome of a year's study and experiment, but it was not presented to the chemical section by the author. Another paper was on hydrogen-sulphide poisoning in the Texas oil fields. W. P. Yant, the author, had to leave to another its presentation to the petroleum section. The mining division had two papers by men with the Bureau, but only one attended, J. J. Forbes.

This does not seem a justifiable economy. The Bureau's work is to move the mining industry to higher levels of safety and efficiency. It must keep in touch with the public if it is going to do this, not only that it may sell its ideas but that it may learn from contact with the public what kind of ideas it should manufacture. It has kept that contact hitherto to the great advantage of the public, and it should continue to do so. Fortunately, the Bureau has other ways of circulating its ideas—direct-by-mail and through the press. Sometimes also meetings are held which officials can attend in numbers by the expenditure of a few cents for car fare or in their automobiles. If it were not for these means it would loose touch with the industries it serves. Is it cheaper for all concerned, however, for the mountain to go to Mahomet rather than Mahomet to the mountain?

Modernizing Railroad and Mine Haulage

ACTUAL ADOPTION by the Chicago, Milwaukee & St. Paul Ry. of roller bearings on the cars of twelve transcontinental trains, while revolutionary in the annals of railroad engineering, is not a new idea. Some of the leading lines, such as the New York Central, Pennsylvania and others, have given much thought and study to this problem during the last few years, and have conducted thorough and exhaustive tests on various types of anti-friction bearings. But it remained for the St. Paul to put cars equipped with such bearings into everyday service.

By test it has been found that a locomotive that could only with difficulty haul twelve Pullman cars equipped with standard bearings over steep grades and along level tangents at high speeds, could haul twenty-one such cars when they were equipped with bearings of the anti-friction type. The advantages realizable from hauling approximately 43 per cent more cars with the same tractive effort are many. Fewer trains at the same or higher speeds mean greater safety, especially during the "rush hours" of commuting to and from the larger cities, because of the greater distances maintained between trains. Naturally, also, fewer trains mean reduced operating and maintenance costs.

There are obstacles to the immediate and universal use of roller bearings by the railroads. Chief among

these is the tremendous cost involved in adapting the new bearings to rolling stock at present equipped with standard journals. Other heavy expenditures would be necessary to enlarge the station and terminal facilities, and to change the switching construction to accommodate the longer trains. But if the experiment of the St. Paul proves entirely successful, and there is every reason to believe that it will, the change to anti-friction bearings could be made gradually.

It is interesting to note that the results of the tests which impelled this railroad to adopt anti-friction bearings closely parallel those obtained several years ago on mine cars. On grades varying from 0.45 to 2.4 per cent it was found that a mine locomotive could haul, at a given speed, only twelve mine cars equipped with plain bearings. When the same type of car was fitted with bearings of the anti-friction type, however, and was moved at the same speed, the locomotive could haul from eighteen to twenty-five, depending upon the grade. Such bearings for mine-car use are heavier than plain bearings but greatly reduce train resistance and require less frequent lubrication and inspection. All of which speeds up production and reduces costs.

Some coal companies have been using mine cars equipped with anti-friction bearings for several years. But there are many others that, for one reason or another, have not seen fit to adopt them. All producers should seriously consider the many advantages to be gained through the use of improved mine-car bearings and by maintaining the mine track in proper operating condition. Other things being equal, they must modernize this phase of their business, among others, if they are to survive the economic struggle in the coal industry.

Practical Standardization

STANDARDIZATION OF SIZES and preparation has been preached much and practiced little in the bituminous coal industry. Several years ago the late H. C. Adams spent several weeks trying to persuade Illinois and Indiana operators to escape from the multiplicity of sizes into which sharp competition had drawn them. The effort failed because some producers refused to surrender the advantage which they felt their particular sizing gave them. During the war the pool system of grading tidewater coal was enforced by government order, but many shippers have since abandoned pool designations of their coals.

Undismayed by these failures, members of the Monongahela Coal Operators' Association now plan standardization of both sizes and quality. When their plan is in operation they hope to be able to market their coal on the basis of a definite average B.t.u., maximum sulphur and moisture content and a minimum fusing point. The program, in which they have enlisted the aid of the Department of Commerce, also calls for a reduction in the number of sizes and the adoption of standard cleaning equipment. Finally, in order to capitalize their scheme, the operators plan to trademark their coal and back this trademarked product by an advertising campaign.

The conception of the program is plainly meritorious. Coal distribution has been, and still is, too much of a helter-skelter business. Lack of published standards and a suspicion of insufficient or incompetent policing have reacted unfavorably upon the industry in the past. The many producers who have taken high pride in quality and preparation have suffered from an indiscriminate public appraisal. Anything which tends to individualize coals and by so doing to emphasize their special adaptability to particular uses must be a step in the right direction.

In some quarters there may be a disposition to look askance at the invocation of the aid of the Department of Commerce. Government supervision of coal is still so much a political issue that an appeal for federal co-operation—harmless and proper in itself—readily may be misinterpreted and misused by those who advocate compulsory regulation. From that standpoint at least the timing is unfortunate. There is always the danger that a limited partnership between government and industry may be converted into an argument for a general partnership in which the industry becomes the creature of the government.

Yet, on the other hand, the willingness of this group of operators to invite federal assistance in working out a program which will benefit the public is convincing evidence that the industry's opposition to political control is not mere blind defiance, but the result of a careful consideration of the basic issues. Because the government may set up standards of preparation at the solicitation of the producers is no reason why it would be proper for the government to fix prices, zone markets or regulate the general conduct of the coal industry. The line of demarcation between voluntary co-operation and compulsory regulation ought to be clear.

Whether the plan of the Monongahela association will be successful will depend as much upon the money which the operators devote to advertising as upon the changes and improvements in operating practices which may be necessary to give the program practical effect. The success of the mouse-trap builder in the wilderness is fiction undefiled by fact. No business idea can yield profit until it has been sold to the public. Inadequate advertising has been one of the greatest drawbacks to merchandising in the coal industry. If the Monongahela association can pave the way to continuous, large-scale paid publicity, it will be performing a real service.

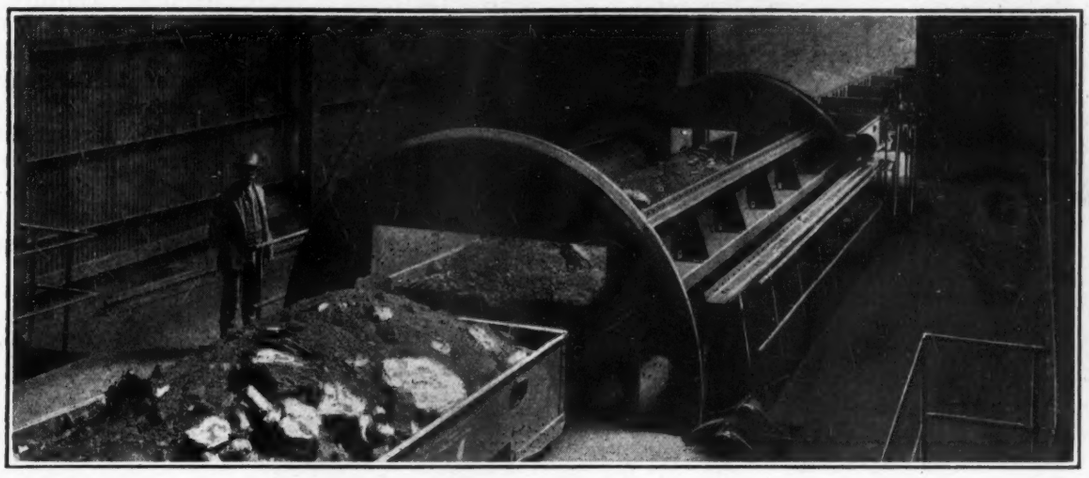
With Bath

"THEY ASK YOU, 'Has it got a bath?'"

Thus spoke the superintendent of a southern West Virginia mine recently in discussing the increased demand for miners. His words were significant. First, they indicate that the demand for coal is such that the miners are picking their jobs and, second, that the time is not far distant when company-owned houses will be of little value unless equipped with bathrooms.

For several years it has been the standard practice in the Southern fields to equip the "official" houses with baths. These include the dwellings occupied by the office men, engineers, foremen, and so on. But, due to the move to reduce overhead expense, some of the officials' houses became available to the miners. At a few operations all of the newer houses for miners have baths. The result has been that a great many of the miners have learned the convenience and comfort afforded by living in a house equipped with this erstwhile luxury.

It is to be expected that the demand for such houses will increase rapidly. A man will want the same conveniences as his neighbor or as some acquaintance at another mine. This trend should be considered carefully by the operator who anticipates erecting a block of new houses or who is planning an expenditure for improvement of old dwellings.



Modern Tipple Prepares Friable Pocahontas Coal

Large Mine Car Used—Rotary Dump So Designed as to Avoid Unnecessary Degradation—Retarding Conveyor Transports Coal to Tipple and Rock to Refuse Bin—Five Sizes or Any Combination May be Shipped

By George S. Jaxon
Engineer, Link-Belt Co., Huntington, W. Va.

George S. Jaxon

ON THE HEADWATERS of Dry Fork in McDowell County, West Virginia, and Tazewell County, Virginia, lies the coal operation of the Pocahontas Corporation. It is located about 34 miles from the town of Iaeger, W. Va., and ships over the Norfolk & Western R.R. Although this property lies partly in West Virginia and partly in Virginia, the town is located within the latter state and is known as Amonate.

Within the last two years, a modern mining community has here sprung up. It consists of dwellings, commissaries, recreation halls and other necessary buildings. Wide asphalt streets and cement walks are noticeable, while all dwellings have been erected upon good-sized lots, separated by neat and substantial fences. Around the houses are well-kept flower beds and lawns. A goodly supply of shade trees has been planted and within a few years this town will become quite a garden spot as well as being a mining community of appreciable size.

This company commenced mining operations on Dec. 2, 1925, working the No. 5 Pocahontas coal bed. The property contains approximately 30,000 acres of this fuel, which averages about 5 ft. in thickness. The Pocahontas No. 31 mine is a drift operation and mining is being conducted on the room-and-pillar system. All coal loading is accomplished by machines of the Coloder type.

It is indeed a credit to the organization that it had the foresight to acquire this high-grade coal property. There is no question but what a flourishing market will be found for its product, especially when one considers the modern equipment installed to handle the output and prepare it for shipment. Inside mining conditions also are excellent; the roof and floor are of good quality, lending themselves admirably to mechanical loading.

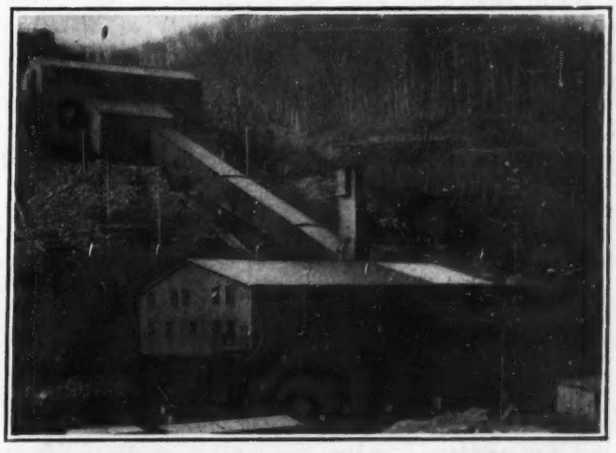


Fig. 1—General View of Headhouse and Tipple

Coal discharged from mine cars in the headhouse is brought down the hillside by the lower strand of a retarding conveyor, the upper strand of the same chain taking rock and refuse back up the hill to the slate bin. This conveyor thus performs a double function.

Modern business and industrial operations are conducted on a large scale. The headpiece shows the two-car rotary dump in the tipple at Amonate, Va. At present each car holds 5 tons of coal, but it is the intention later to increase the height of the box so that it will contain 7½ tons. This will mean 15 tons of coal at each revolution of the dump.

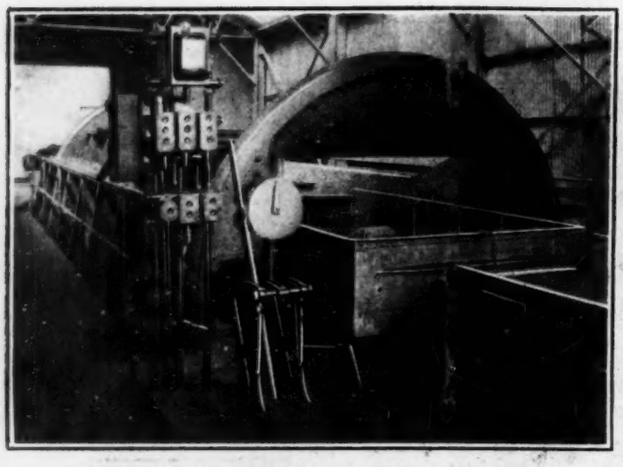


Fig. 2—Control Equipment of Rotary Dump

This is a one-man control and the operator governs both the car-haul and the dump proper. It would be difficult to conceive of a simpler device for the purpose than the push-button switch. By means of the equipment here shown a whole trip, consisting of both coal and rock, can be discharged without uncoupling a single car.

One of the largest mine cars in the United States is here employed. It is designed to eventually hold 7½ tons of coal, but at the present time is made only of such a height as to carry five tons. As the development proceeds, however, this car will be raised until its capacity reaches the maximum intended. In construction it is of the square or box type, without endgate and with wheels projecting upward into the bottom, protected by means of heavy pressed-steel hood plates, or housings.

Being desirous of preparing its product in the most economical and thorough manner, to meet the requirements of an exacting market, the Pocahontas Corporation decided to equip the entire operation, both inside and out, with machinery of modern and practical design. Accordingly, in November, 1924, it contracted with the Link-Belt Co. to design, manufacture and erect two modern up-to-date preparation plants to produce the highest grade of sized lump, egg, nut, pea and slack coal. Each of these plants has an hourly capacity of 500 tons of run-of-mine, which is, of course, graded into the sizes named.

The following is a description of the equipment which the Pocahontas Corporation considered best suited to its requirements. From the time the coal leaves the working face until it is deposited within the railroad car, every consideration has been given to the particular type of machinery employed in its handling. It is loaded into mine cars by the Coloder, as previously noted, after which trips of 100 of these cars may be made up and hauled to the preparation plant by means of 20-ton locomotives.

The loaded trips are delivered to a reversible automatic loaded trip feeder or chain haul. This machine is capable of feeding the cars uniformly two at a time, without uncoupling, into a specially designed tandem-type of rotary dump. This machine is of rugged construction throughout, in order to successfully fulfill the heavy duty it is called upon to perform continuously. The chain links are made of high-grade carbon steel while the dogs are of steel casting. All the driving gears are also of steel casting, those operating at high speed having cut teeth.

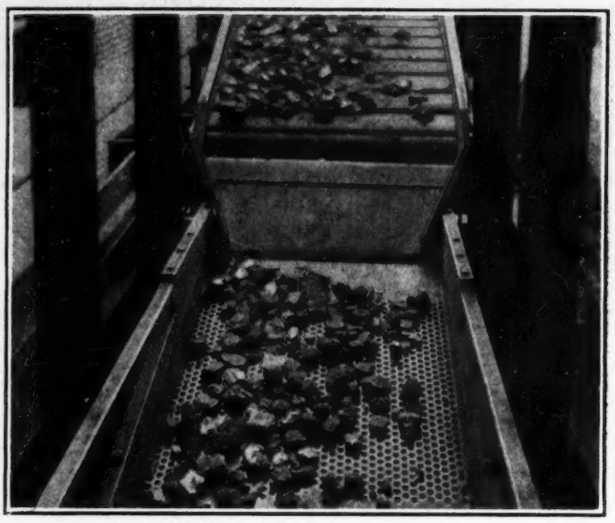


Fig. 4—End View of Degradation Screen

Operation of these screens is far more rapid than that of the primary screens separating the various sizes. Not only is suspension made by means of flexible boards but the connecting rods are flexible also. Rigid attachment of these rods prevents all possibility of wear at their screen ends.

In order to insure continuous operation of this feeder haul, a duplicate set of driving machinery, complete with a spare 150-hp. driving motor, has been installed. Should a breakdown occur for any reason the haul can thus be actuated from the duplicate machinery without stoppage or hindrance to dumping operations.

The electrically driven rotary pump at this operation is unusually large. It is so constructed that unnecessary breakage of the coal is avoided. Electrically operated fly gates in the chutes below may be opened at will by means of a push button. This provides for rock cars coming along either one or two at a time. In this manner refuse material is handled through the coal dump, yet is kept separate without the least interference to dumping operations.

No uncoupling of cars is necessary, and the empties leaving the dump are still coupled together and form a complete empty trip on the track beyond the preparation plant.

After being discharged by the rotary dump to the hopper beneath, the coal is automatically and uniformly fed, by means of a double-strand conveyor, to the carrying trough on the lower run of a retarding conveyor. This machine, at this operation, performs two functions

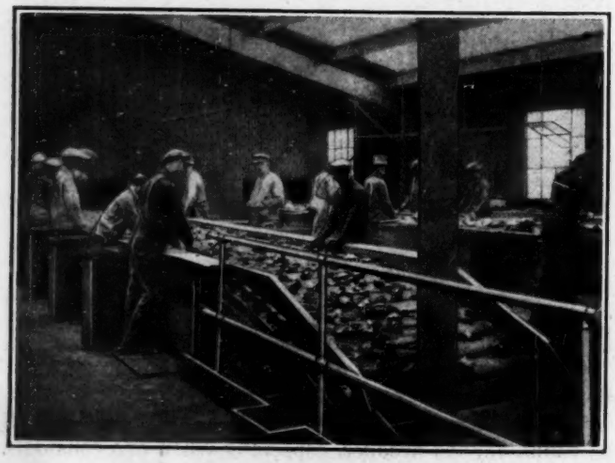


Fig. 3—Lump and Egg Picking Tables

After picking on these tables both sizes are carefully discharged to the degradation screens by which undersize is removed. Ample illumination is furnished by large skylights in the roof. Electric lights are also provided.

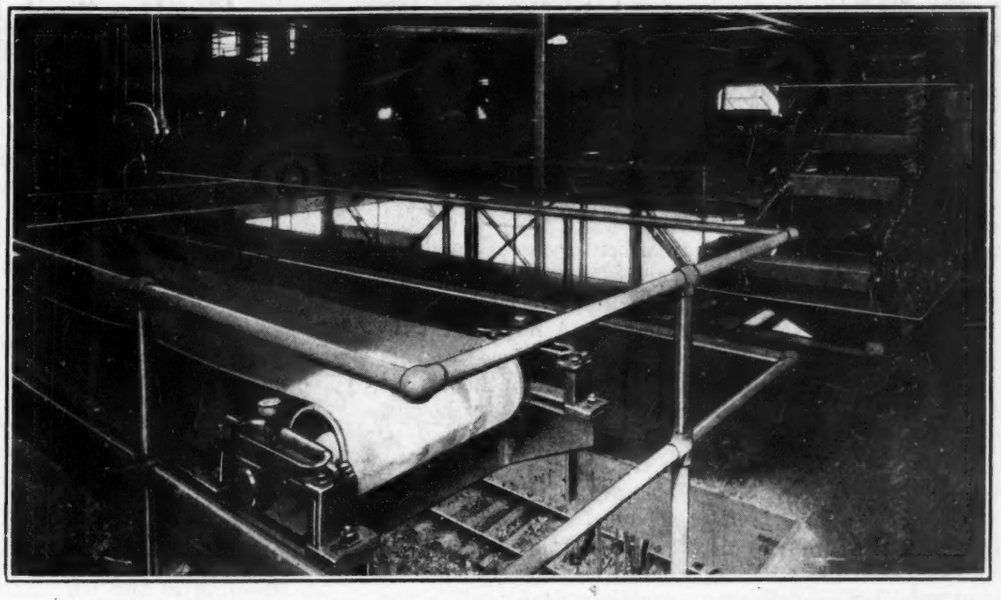


Fig. 5—Nut Boom and Mixing Conveyor

The boom for loading nut coal is of the belt type whereas those employed for transporting the larger sizes are of the pan variety. By means of the cross conveyor shown in the right background various combinations of sizes can be made. This enables the shipment of any grade or mixture of grades that the existing market may demand.

—its lower run carries coal down the hill to the sizing screens of the preparation plant, while simultaneously the upper or return run transports refuse up the hill to the rock or refuse bin. It is a double-strand 24-in. pitch steel-strap roller chain, carrying $\frac{5}{16}$-in. flights 12 in. wide and 48 in. long. The head sprocket is equipped with armor-clad teeth, so that as wear develops the armor can be renewed without scrapping the balance of the wheel.

For handling rock at the refuse bin, a specially constructed pan conveyor 60 in. wide has been installed. The pans here employed are filled with oak planks, the steel acting merely as armor over their tops, thus preventing damage as rock falls onto the conveyor. This machine delivers refuse from the bin to the rock car, and in order to prevent overflow while a car is loading, the driving motor is equipped with a solenoid brake that insures immediate stoppage upon the manipulation of the proper push button.

The retarding conveyor carrying coal down the hillside operates on an inclination of 22 deg. It measures 280 ft. long from center to center of sprockets. Coal is discharged from its lower trough to a set of shaker screens 8 ft. wide. These are of the inclined gravity type, and suspended from the tipple structure by means of hanger rods or flat bars with upset eye ends. These are accurately drilled to a definite length. These screens operate at 100 oscillations — i.e., 100 forward and 100 reverse strokes—per minute. They grade the coal into the following sizes: 4-in. lump, 2½x4-in. egg, and a 2½-in. mixture of nut, pea and slack. The lump and egg are delivered to picking tables but the mixture is sent to a double set of flexible-hanger screens for further separation.

These screens operate considerably faster than the main shakers. Upon them, three sizes—nut, pea and slack—are prepared. The nut is delivered to a 60-in. picking table similar to those employed for the lump and egg. The pea and slack sizes are loaded on their respective tracks by means of specially designed loading chutes, so built as to prevent unnecessary breakage.

The picking tables employed for the lump, egg and nut sizes are each 60 in. wide and are provided with pans having curved tops. On these tables the impurities are picked out by hand, over 30 ft. of clear picking space being provided on each. Specially constructed shaking degradation screens, which take out the undersizes, are provided. On leaving the degradation shakers each size is delivered to its loading boom. The boom employed for loading nut coal is of the belt conveyor

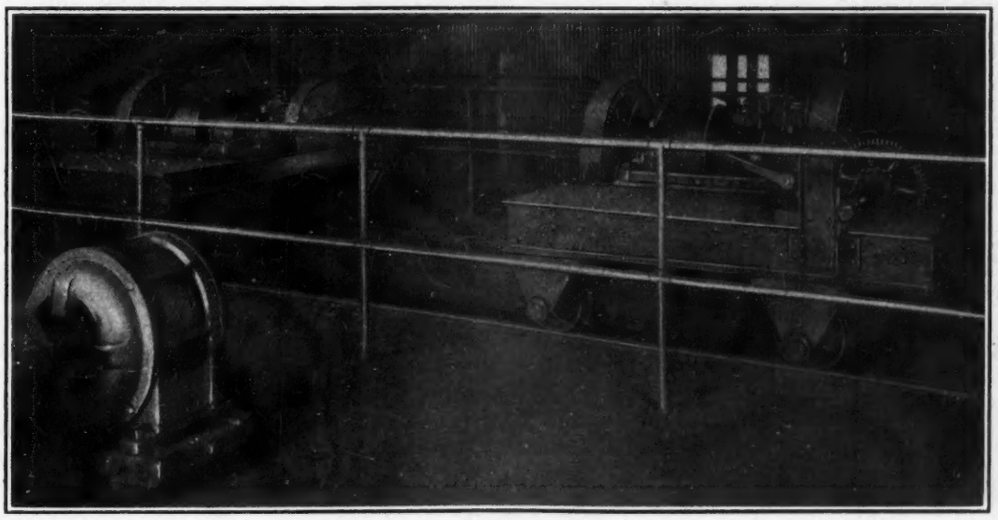


Fig. 6—Differential Boom Hoists

By means of these machines the lump and egg booms may not only be lowered into or raised out of open-top cars but they may be slewed sidewise as well, so that cars may be loaded upon either of two parallel tracks. This provision for slewing the booms avoids loss of time in shifting loading operations from one car to another.

type, while those for the lump and egg sizes are of the curved-top apron type, and are mounted on horizontal turntables. This mounting gives the booms not only a vertical motion that permits raising them out of or lowering them into open top cars, but affords a horizontal swiveling motion that is utilized when it is desired to make picked and cleaned run-of-mine coal.

Five different sizes of products may thus be loaded simultaneously on individual tracks. It is possible, however, by means of a longitudinal belt conveyor handling slack and a cross-flight conveyor at the end of the booms to make any mixture of nut, pea, and slack with either the lump or egg as may be desired. A novel arrangement of loading run-of-mine coal is introduced at this operation, and works in conjunction with the swivel loading booms. At the end of the lump and egg booms, a reversible scraper conveyor is employed to continuously load run-of-mine coal on the lump and egg tracks alternately. By means of push buttons the man on the trimmers' walk loads first a car of coal with picked run-of-mine on the lump track, and then, by pushing the button, the travel of the cross conveyor is reversed, and run-of-mine delivered into the railroad car on the egg track. The lump and egg booms are raised and lowered by means of differential hoists but the nut loading boom is supported by a standard hoist. For raising and lowering the run-of-mine loading chutes, and lengthening them out, a standard electric hoist is also employed.

AUTOMATIC BUCKET SKIP HOIST USED

Bone from the picking tables is delivered by means of conveyors to a 30x30-in. Link-Belt single-roll crusher, where it is reduced in size to approximately 1-in. cubes and smaller. It is then delivered to the skip hoist.

At this plant an automatic, balanced, bucket-type of skip hoist provided with an automatic feeding device is employed. This system handles the crushed bone in one bucket while the other is utilized for rock and slate from the picking tables. The bucket handling the crushed bone and rescreenings delivers this material to the lower run of the retarding conveyor which discharges it to the shaking screens, while the bucket handling refuse delivers its contents to the upper run of the same conveyor by which it is moved up the incline and discharged into the refuse storage bin.

With the exception of the car haul, all motors employed are of General Electric manufacture, type F.T.R. The two motors connected to the car haul are of the slip-ring type. Surface structures of this plant are of steel throughout, provided with 4-in. reinforced-concrete floors with curb angles or nose pieces around the edges.

All machines and motors are electrically interlocked, and emergency stop buttons are provided in strategic locations throughout the plant. A coal washery is now in course of construction and will be completed within the next few months. This will contain four 50-ton Shannon jigs, complete with necessary elevating, conveying and dewatering systems, as well as flexible-type shaking screens for sizing the products after they have been washed.

The preparation equipment, exclusive of the washery, has been in operation for more than a year, and has given excellent results. The tipple at this Pocahontas No. 31 mine constitutes an excellent example of an installation intended to carefully handle and prepare a soft or friable bituminous coal.

Five-Day Week Discussed

During its observance of Management Week, which was requested by the U. S. Department of Commerce, Joseph W. Roe was the speaker at a dinner meeting of the Society of Industrial Engineers held in New York City on Oct. 26. In discussing the subject of a five-day week, interest in which has been aroused by the declarations of Henry Ford, and those of William Green, president of the American Federation of Labor, Mr. Roe stated that two significant features of the proposition stood out prominently. One of these was the fact that its sponsor was Henry Ford, a man prominent in the automotive industry, not only because of the position he occupies but also because of the success attained by his previous revolutionary ideas in regard to labor, production and wages. The other striking feature was the temperateness and sobriety in which the announcement of the American Federation of Labor had been given. He stated that 25 years ago such an announcement coming from labor would not have been regarded with as much respect as today.

In speaking of the temperateness of this announcement and movement to which labor has pledged itself, Mr. Roe mentioned that the labor leaders intended to center their efforts only on industries that are now ready for the five-day week. According to Mr. Green, these industries were the automotive, the building trades and coal mining.

It was significant, the speaker continued, that Mr. Green had coupled the increased productive capacity of these industries with his five-day week program. There are many industries in which the five-day week would be an economic disaster, while to others it might prove a benefit. He made the distinction that any industry whose entire production, or any great increase therein, was dependent upon hand labor, was not ready for the five-day week. On the other hand, those industries in which increased production is entirely dependent upon the machine used and not upon its attendant could adopt the five-day week without disastrous result.

He traced the movement for shorter hours from the year 1802, when the British Parliament passed a law that children under 10 years of age should not work more than 70 hr. per week. Following this came the 10-hr. day, and later, the 8-hr. day, and the question now arises, where are we going to stop?

Another consideration which seemed important to Mr. Roe was the fact that with the decreasing number of hours worked we were continually enjoying better goods and services at less cost, and were, all things considered, attaining a higher level of living and civilization than ever before. The five-day week, if it is accompanied by increased production, will result in goods and services at lessened cost, and in the satisfaction of more leisure and less labor.

There was, according to Mr. Roe, nothing new in the five-day week idea. He stated that as far as the coal mining industry was concerned both workers and operators would probably be better off with a shorter week and more of them. The chief point made was that each industry was a problem within itself and must face the facts individually. If by the co-operation of labor improved production methods could be secured so that better goods and services could be obtained at a less cost, the five-day week would not prove to be such a disaster it might at first sight appear.

What Conditions Cause Blownout Shots to Ignite Mixtures of Air with Gas or Coal Dust

Coal-Dust Stemming May Be Worse than None—If Shot Blows Out Air Spaces Increase Danger Slightly—Rock-Dust Tamping Better than Moist Clay—High Explosives May Ignite Gas by Compression

By G. St. J. Perrott
Assistant Chief Explosives Chemist, U. S. Bureau of Mines, Pittsburgh, Pa.

ONE OF THE MAJOR hazards in coal mining is the danger of igniting explosive mixtures of methane and air, or coal dust and air, or both, by the explosives used in blasting. It has long been recognized that certain explosives are more dangerous than others in this respect. Both in America and abroad, government testing stations have been established for officially passing on the suitability of explosives for use in coal mines.

In this country, the federal government is given no power to inforce the use of the approved explosives but merely publishes from time to time, through the Bureau of Mines, a list of those explosives which, having passed certain established tests, are thereby believed suitable for use in coal mines. In spite of this lack of police power, the increase in the use of permissible explosives since the promulgation of the first list, in 1909, has been rapid. In 1912, only 8 per cent of the explosives used in coal mines were permissible; in 1925, this figure had increased to 25 per cent.

Though the past record of permissible explosives has been most gratifying, it is highly desirable that the way be paved for further improvement in explosives and blasting methods by learning more about the mechanism by which explosives ignite gas and coal dust. To this end, considerable investigative work already has been carried out by the Bureau of Mines, but much still remains to be done in this direction.

It is my purpose to discuss briefly the degree in which the characteristics of explosives and the method of loading in the borehole increase or decrease the likelihood that a blownout shot will ignite mixtures of gas or dust with air. For an account of the methods by which an explosive is tested the reader is referred to Schedule 17-A of the U. S. Bureau of Mines.

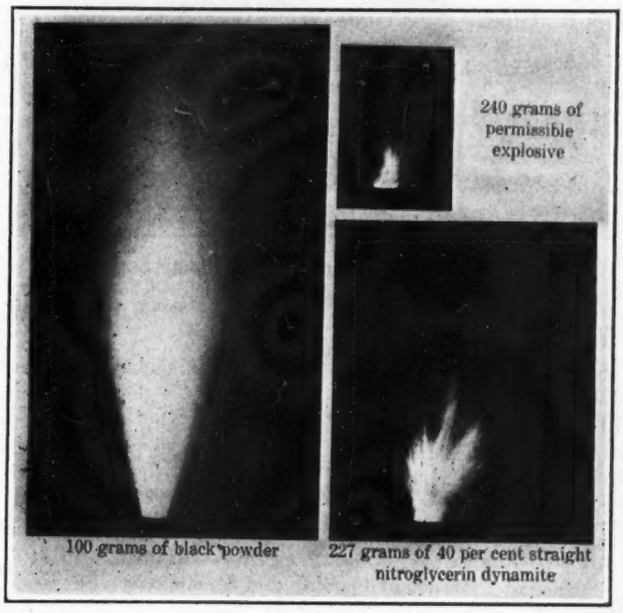


Fig. 1—Photographs of Flame from Various Explosives

All of these shots were stemmed and fired from a cannon. It will be observed that black powder gives a much bigger flame than dynamite, which in turn gives a bigger flame than permissible. It will be noted also that the charges of both dynamite and permissible were much larger than that of black powder.

The factors that affect the liability of an explosive to ignite gas or dust are already known in a qualitative way, but quantitative data for the most part are lacking. It is generally conceded that the probability of an explosive igniting combustible mixtures depends upon (1) the temperature, size and duration of the flame evolved, and (2) the heating of the combustible mixture, produced by adiabatic compression, as the hot gases are rapidly discharged from the borehole.

These factors not only depend upon the character of the explosive but also upon the position of the borehole with respect to the entry, the size and form of entry or room in the mine, the method of loading in the borehole, its diameter and length, size of cartridge and type of stemming employed. A permissible explosive differs from dynamite and from black blasting powder in that it produces a smaller flame of lower temperature and shorter duration. This type of explosive has often been called "flameless," but all explosives, when fired so as to discharge the resultant gases from the mouth of the hole as in a blownout shot, produce a visible flame which can be photographed.

The greater part of the permissible explosives used in America are of the ammonium nitrate-nitroglycerin type, and contain about 10 per cent each of nitroglycerin and wood pulp, the remainder being ammonium nitrate, plus from 2.5 to 15 per cent of sodium nitrate or sodium chloride. The latter ingredients, particularly sodium chloride, are added to reduce the size and temperature of the flame. The rates of detonation of the explosives range from about 1,800 to 4,000 m. per second. The change in rate from low to high is usually brought about by employing ammonium nitrate of different physical characteristics.

Fig. 1 shows the difference between the flames produced by permissible and other explosives. These illustrations are made from photographs of flames produced by charges of explosives fired from a steel cannon into the air. In the shot of black powder, 1 lb. of

Paper presented at meeting of American Institute of Mining & Metallurgical Engineers at Pittsburgh, Pa., Oct. 5-9, entitled, "Factors in the Ignition of Methane and Coal Dust by Explosives," and published with approval of the director of the U. S. Bureau of Mines.

stemming was used whereas in the case of the other two explosives, ¼ lb. of stemming was employed. A larger quantity of stemming cools the flame from detonating explosives to such an extent that photographing is difficult.

The weights of permissible explosive and 40-per cent nitroglycerin dynamite used were equal in strength as determined by the ballistic pendulum,* whereas the quantity of black powder used was about one-fourth the strength of the charge of the other two explosives. A larger quantity of black powder gave a flame too voluminous for the scale of the photograph, but, even from the quantity used, it will be seen that the flame is considerably larger than for the other two explosives, and evidently extremely likely to ignite explosive mixtures of air with gas or coal dust. The flame from the permissible explosive is much smaller than that from 40-per cent dynamite. Photographs taken on a moving film show further that the flame from the shot of black powder is of much longer duration than that from one of dynamite and permissible explosive.

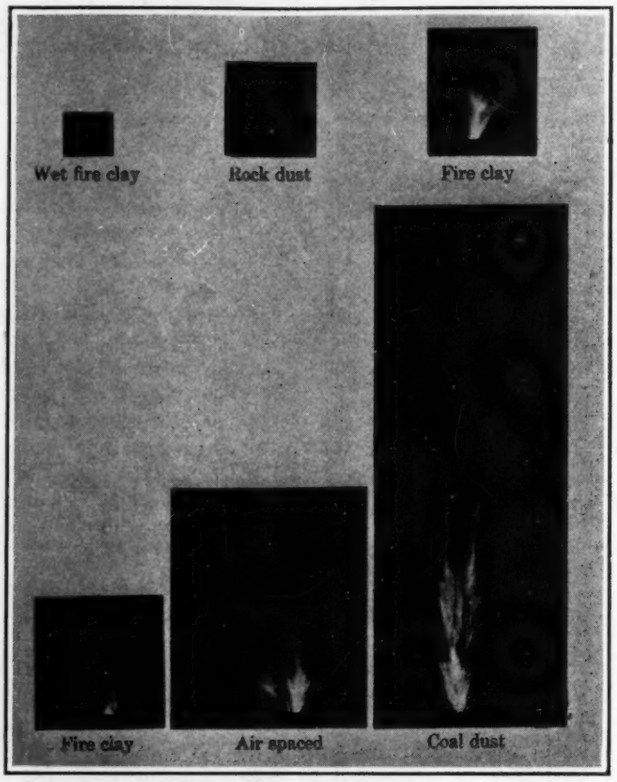


Fig. 2—Effect of Stemming on Flame Length

Here it will be observed that the coal-dust stemming gave by far the bigger flame. Wet fireclay gave the smallest flame with rock dust stemming as a close second.

The flame photographs give a qualitative indication of the safety of the explosives as determined at the explosives testing station at the Bureau's experimental mine, in the gas-and-dust gallery. This is a cylindrical steel chamber of 6 ft. 4 in. diameter and 100 ft. long. One division, 20 ft. long, may be separated from the remainder by a diaphragm, thus forming a chamber which contains the explosive mixture of gas and air or coal dust and air, or both. A charge of explosive is fired from a steel cannon into this division of the gallery to determine whether the explosive will ignite the mixture. The bore of this cannon is of 2¼ in. diameter and its length is 21½ in. It has a capacity for holding as much as 2 lb. of explosive with space for stemming if desired.

In determining the relative safety of different explosives by this test, or for a given explosive to find the effect of different methods of loading or of various concentrations of gas and air, what is known as the "limit charge" is determined. This charge is defined as the maximum weight of explosive that will not ignite the mixture in the gallery in five or more shots. Greater weights than the limit charge do not always cause ignition until the limit charge is much exceeded.

In obtaining the data set forth in Table I, the first 20-ft. division of the gallery contained air mixed with 8 per cent of natural gas.† This gas was of approximately the following percentage composition: Methane, 88; ethane, 7; propane, 2.5; butane, 1 and nitrogen, 1.5. Explosive *A* had the following chemical composition: Nitroglycerin, 10 per cent; ammonium nitrate, 79; calcium carbonate, 1, and wood pulp, 10. The weight of wrapper per 100 gm. of explosive was 8 gm.; the density, 0.97 gm. per cubic centimeter; the rate of detonation, 3,500 m. per second. Unless otherwise stated, 1 lb. of stemming was used.

The increased safety of stemmed over unstemmed shots is shown by a limit charge of 20 gm. for the unstemmed shot as against 225 gm. for a shot tamped with 1 lb. of dry fireclay. Fine rock-dust stemming is apparently more efficient than the fireclay, as evidenced by a limit charge of 500 gm. Half a pound of coal-dust stemming gives a limit charge of 150 gm., but coal dust is out of the question for this purpose because of its great hazard. A little moisture added to the fireclay increases the limit charge markedly.

Table I—Limit Charges in 8-Per Cent Natural Gas; Effect of Method of Loading and Stemming

Stemming	Method of Loading	Limit Charge Grams
None	Density-of-one†	20
Dry fireclay	Density-of-one†	225
Moist fireclay*	Density-of-one†	400
Dry fireclay	8-in. air space	125
Dry fireclay	4-in. air space	175
Dry fireclay	Cartridge laid in borehole	175
Moist fireclay*	8-in. air space	375
Rock dust	Density-of-one†	500
Coal dust, (½ lb)	Density-of-one†	150

†Density-of-one indicates explosive was tamped tight into borehole. *1.4 oz. water per lb. of stemming.

An 8-in. air space between the explosive and fireclay stemming reduces the limit charge to 125 gm. The same effect is evident, but to a less extent, when cartridges of 1¼-in. diameter are laid in the 2¼-in. cannon bore, but not so compressed as to fill it. The limit charge under these conditions is 175 gm., as against 225 gm. for a similar shot with no air space between explosive and borehole. The loading density is about 0.9 gm. per cubic centimeter; with the 8-in. air space it is 0.13 gm. per cubic centimeter; when cartridges are laid in the borehole, it is 0.23 gm. per cubic centimeter.

It should be borne in mind that the gallery test is

*Bulletin 15, Bureau of Mines, 1912, p. 79 ("Unit deflective charge" is defined as weight of explosive which gives same swing of pendulum as 227 gm. (½ lb.) of Bureau of Mines' forty-per cent standard dynamite).

†Calculated on nitrogen-free basis and figured as methane plus ethane, from data of an analysis by slow combustion pipette in Orsat apparatus.

carried out under standardized conditions and that other factors may affect the results obtained in actual mining. For example, the shot is fired from an unyielding steel borehole; hence, it is always a blownout shot whatever the nature of the stemming material. In blasting coal, other things being equal, a blownout shot is least likely to occur with the stemming material which offers best confinement. This factor cannot be evaluated in the gallery tests.

The danger of using coal-dust stemming has been well demonstrated in a recent series of tests in which 1½ lb. of a permissible explosive was fired into the gallery which contained 4 per cent of gas and 20 lb. of coal dust on the shelves. With no stemming, this explosive caused no ignitions in ten shots. With 1 lb. of coal-dust stemming, two ignitions were obtained out of thirteen shots; with ½ lb., six ignitions out of ten shots; and with ¼ lb., five ignitions in six shots.

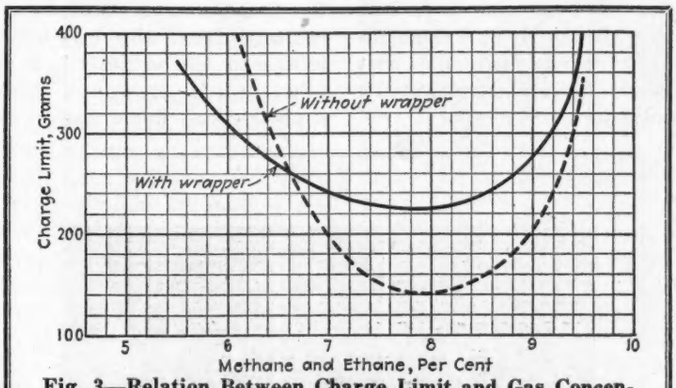


Fig. 3—Relation Between Charge Limit and Gas Concentration for a Permissible Explosive

It will be noted that the graph representing use of the explosive with wrapper is a much smoother and more regular curve than that depicting the behavior of the same explosive when fired without wrapper.

The first condition with no stemming is identical with the conditions of Test 4 of the regulations, which is one of the tests that all explosives on the permissible list must pass. It is evident from the above results that coal-dust stemming increases the danger over that existing when no stemming is used. Though the larger quantities of coal dust thus used do not give rise to ignitions as frequently as the smaller amounts, it is evident that the use of combustible stemming always entails an increased hazard.

Fig. 2 illustrates the relative safety of the several methods of loading. In all cases 330 gm. of the explosive was used and 1 in. of the borehole was filled with about 150 gm. of incombustible stemming and 80 gm. of coal dust. More stemming was not used because the flame is thereby cooled to a reddish color, of which a photograph cannot be made.

It is interesting to speculate on the reason for the decreased limit charge when an air space exists between explosives and stemming. Tests in a specially-designed apparatus, by means of which the gases produced when a charge of explosive is fired from the cannon can be caught for analysis, have shown that much more combustible gases are formed by an air-spaced shot than by a density-of-one shot. This undoubtedly results from the lower pressure in the former case, which tends toward the production of relatively more carbon monoxide and hydrogen. The higher percentage of flammable gases produced without any great lowering of flame temperature may be responsible for the lower limit charge with air-spaced shots, or, on the other hand, it may arise from some purely mechanical cause; for example, the manner in which the stemming is projected from the borehole in the two cases. Table II gives the gaseous products of detonation produced by Explosive *A* under the two methods of loading.

Table II—Gaseous Products of Detonation from Two Methods of Loading

Method of Loading	Weight of Explosive	Liters of Gas at 0 Deg. C. and 760 mm. of Mercury from 100 Gm. of Explosive				Carbon Deposited Grams per 100 Gm. of Explosive
		CO_2	CO	H_2	CH_4	
Density-of-one.....	156.6	11.5	4.6	3.9	3.7	1.8
8-in. air space.....	159.6	11.5	9.6	9.2	2.0	0.0

As small a quantity as 5 gm. of black powder tamped with 1 lb. of dry fireclay stemming will ignite a mixture of 8 per cent natural gas and air in the gallery. Under similar conditions, 150 gm. of 40-per cent straight dynamite is necessary. All permissible explosives require a larger quantity than the unit deflective charge. The limit charge of the ammonium-nitrate explosives is raised by the addition of a cooling agent such as sodium chloride or by so changing the composition that there is a deficiency of oxygen, which produces more carbon monoxide when the explosive is detonated, thereby giving a flame of lower temperature.

For explosives of identical chemical composition, those with the higher rate of detonation have the lower limit charge. For example, two explosives of the ammonium nitrate-nitrogen class, containing 10 per cent of salt, detonated at rates of 2,100 and 3,300 m. per second, respectively, and showed limit charges in 8-per cent mixtures of natural gas of 359 gm. and 275 gm. In another group of similar explosives without salt, the rates varied from 2,200 to 4,000 m. per second and the limit charges from 250 to 175 gm. respectively.

It is difficult to determine the limit charges in mixtures of coal dust and air in the absence of gas or in the presence of low percentages of gas, because of the large quantities of explosive that must be used if this explosive is of permissible type. Experiments in which the gallery contains 4 per cent of gas and 20 lb. of coal dust on the shelves show that 25 gm. of black powder will cause an ignition, whereas 680 gm. (1½ lb.) of a permissible will not.

Fig. 3 shows the relation between the limit charge and the concentration of natural gas for Explosive *A* previously mentioned. When this explosive is fired in its original wrapper, the most sensitive mixture is between 7½ and 8 per cent of gas and the curve is fairly flat between 7 and 8½ per cent of gas; in other words, variation of gas concentration between these limits does not affect the limit charge to any great extent.

Change in concentration beyond these limits rapidly decreases the sensitivity of the gas mixture, but the change is less rapid for concentrations lower than 7 per cent than it is as the concentration is increased

above 8½ per cent. This is probably due to the fact that the combustible gases given off by the explosive tend to raise the concentration of the gas mixture, the effect of which is to increase the sensitivity of such mixtures in concentrations lower than the most sensitive mixture.

This point is well corroborated by results obtained, when the explosive is fired without its wrapper. The explosive then contains slightly more oxygen than is necessary for complete oxidation of the carbon and hydrogen to carbon dioxide and water. The effect of this is to reduce the limit charge at gas concentrations between 7 and 9 per cent and to raise it at concentrations of 6.5 per cent and lower, also to make the most sensitive mixture a somewhat higher concentration than in the case of the explosive with wrapper.

The reduction of the limit charge at concentrations approximating 8 per cent is due to the fact that the flame of the explosive fired without wrapper is hotter (calculated temperature, 2,670 deg. C.) than the flame produced when fired with wrapper (calculated temperature, 2,070 deg. C.), whereas the apparently paradoxical behavior at concentrations below 6.5 per cent is due to the fact that in the case of the explosive without wrapper no combustible gases are produced to increase the gas concentration in the gallery, whereas the detonation of the explosive and wrapper produce such gases. Thus, the effective concentration in the latter case is higher than that present in the gallery before the explosive charge is fired.

The curve in the former instance is thus fairly symmetrical around the most sensitive concentration, whereas in the latter case it is not. It would naturally be expected that an explosive containing a large excess of oxygen would give a steep curve on the low side of the most sensitive mixture and a less steep curve on the high side; in other words, the reverse of that obtained with the present explosive when fired with wrapper.

It is obviously desirable to know more about the conditions that cause ignition of gas and coal dust by explosives, and the factors that affect the liability of ignition. As previously explained, these are already known in a qualitative way, but the relative importance of the various factors is uncertain, and measurement of the temperatures and pressures produced has not been accomplished as yet.

Temperature may be calculated by making use of a number of assumptions, but it is questionable how close calculated values check actual temperatures, in view of the lack of information concerning the conditions prevailing in the flame. A direct method of measuring flame temperature is much needed. Calculated temperatures of the gaseous products of detonated permissible explosives range from 2,100 to 2,300 deg. C., whereas 40-per cent straight nitroglycerin dynamite has a calculated temperature of 2,600 deg. C.

The duration of the flame may be measured by recording its image on a rapidly moving photographic film. Fig. 4 is an illustration made from such photographs. In taking them, a vertical slit about $\frac{1}{32}$ in. in width is placed in front of the rotating film. The duration of the flame, as calculated by Bichel, was measured horizontally from the mid-point of the bottom of the image to the projection of the top of the image; in other words, it was a measure of the total elapsed time that any flame was in existence.

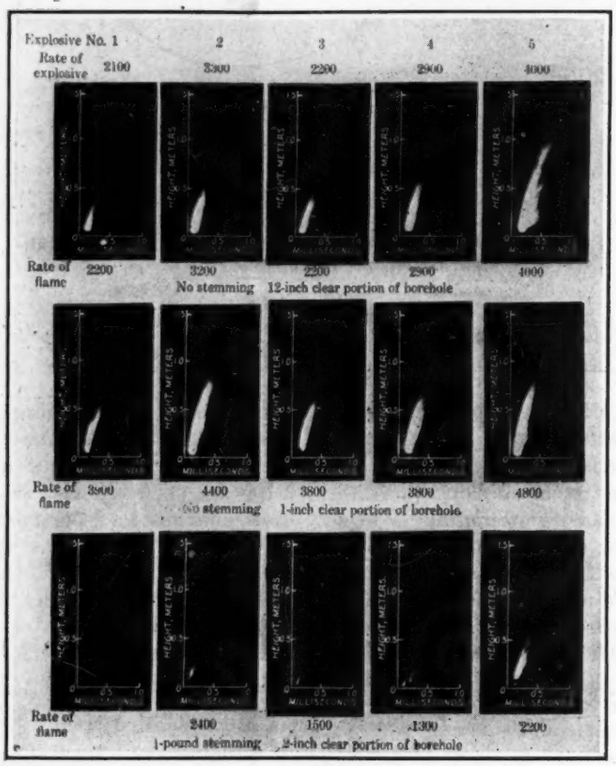


Fig. 4—Permissible Explosive Flames on Moving Films

Inasmuch as the speed of the film is known and constant, the horizontal distance between the base and point of the flame forms a true measure of the flame's duration.

There is no method at present available for measuring pressures produced near the mouth of the cannon. Dixon has shown, however, that a pressure of 54 atmospheres suddenly applied is sufficient to ignite a mixture of 6.5 per cent of methane and air. It is obvious that a sufficiently large charge of an explosive, that produces no flame whatever, might under these circumstances ignite an explosive mixture by compression alone.

The relatively greater sensitiveness of gas mixtures to ignition in galleries of smaller diameter is due to the increased compression and consequent greater heating of the combustible mixture in the small gallery. It is also evident that, other factors being equal, an explosive that has a high rate of detonation might be expected to ignite a gas-and-air mixture more readily than one having a lower rate, because the compression of the combustible mixture at the mouth of the borehole would be greater in the former case. This is borne out by tests in the gallery. However, when the rate of explosion becames as low as that of black powder, the factor of flame duration has a greater effect and the explosive becomes more dangerous.

In this connection, photographs on a moving film of the flames of explosives fired from a cannon are of interest. Fig. 4 shows pictures for five ammonium-nitrate explosives. In an 8-per cent natural gas-air mixture explosive No. 1 has a limit charge of approximately 350 gm.; explosive No. 2, of 275 gm.; explosive No. 3, of 250 gm.; explosive No. 4, one of 225 gm., and explosive No. 5, a limit charge of 175 gm. A unit deflective charge was employed, or about 240 gm. for explosives 1 and 2, and 215 gm. for explosives 3, 4 and 5.

The first horibontal line of pictures shows the results

when the explosive was at the bottom of the borehole. If the rate of projection of the flame for the first 5 cm. is measured, it is found that this rate is about the same as the rate of detonation of the explosive. On the other hand, when the borehole is shortened by partially filling it with fireclay, as in the second line of pictures, the rate of projection of the flame is considerably faster than the rate of detonation. With 1 in. of stemming, the rate is considerably slower than that of the explosive. The illustrations forming Fig. 5 show the same shots but taken with an ordinary fixed-plate camera.

For investigating phenomena that take place in extremely short periods of time, photographic methods seem particularly promising. Photography of flame from explosives fired into air has given results which serve to divide explosives into groups so far as safety is concerned, but does not always distinguish between members of the groups. It is planned to take photographs on a moving film of the ignition of mixtures of gas with air and coal dust with air by explosives fired in a specially constructed gallery of 6 ft. 4 in. diameter and 20 ft. long, with a horizontal slot along the center closed by plate-glass windows. By means of this apparatus it is hoped to obtain further knowledge of the manner in which gas and coal dust are ignited by explosives.

The tests established in 1908 have resulted in the development of permissible explosives that in actual practice have had a remarkable record both from the standpoints of efficiency and safety. However, it is believed that a more complete knowledge of the mechanism of detonation of explosives as well as that of ignition of gas and dust by them should result in the development of explosives and methods of using them having a yet larger factor of safety.

FURTHER INVESTIGATIONS TO BE MADE

It is to this end that the U. S. Bureau of Mines is adding, to its present schedule of official tests, investigations of certain fundamental properties of explosives and of the ignition of gas and coal dust. Invaluable work along similar lines is being conducted in Great Britain, France and Belgium. The difficulties are great, but the goal of increased safety in mining is well worth winning, and is the common aim of much of the Bureau's work. This paper has indicated some of the lines along which investigations in this direction are being conducted.

Though the investigation, of which this discussion is largeley a progress report, is far from being complete, the results obtained, nevertheless, warrant the following conclusions as applying to blownout shots:

1. That the method of loading and the kind and condition of stemming have an important effect on the relative safety as follows: (a) The introduction of an air space between the explosive and the stemming reduces the safety to a slight degree; (b) the conditions which furnish the greatest relative safety are loading the explosive tight in the borehole and the use either of a distinctly moist, inert material, such as damp fireclay or a finely-pulverized inert material such as rock dust; (c) the use of coal dust as stemming increases the danger of ignition of gas or dust by a blownout shot.

2. An explosive gas mixture containing 7½ to 8 per cent of natural gas is the one most sensitive to ignition by the permissible explosives commonly used in coal mines in this country, but between 7 and 8½ per cent there is little practical difference in the sensitiveness of the mixture. On either side of these limits the sensitiveness decreases rapidly. With those gas mixtures most sensitive to ignition (7 to 8½ per cent of gas) a balanced explosive is most likely to cause ignition but an explosive which is underoxidized is more likely to cause ignition of gas mixtures near the lower limit of inflammability, which is the condition commonly met with in practice.

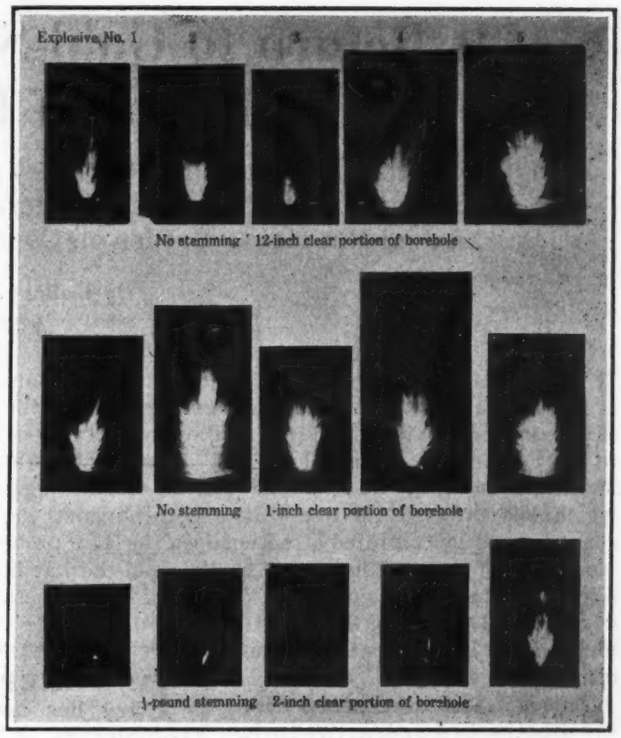


Fig. 5—Still-Plate Pictures of Flames from Permissible Explosives

These photographs are taken in the ordinary manner. They strikingly illustrate the effect of stemming and loading on the volume of flame evolved.

3. Definite indications have been obtained that the rate of detonation is an important factor in the ignition mechanism and that the explosive having the higher rate of detonation may be expected to ignite a gas-and-air mixture more readily than one having a lower rate of detonation.

4. Photography of flames produced by explosives fired into air gives results which serve to divide the explosives into groups so far as safety is concerned. This taken in connection with the composition of the explosive and its rate of detonation, promises to throw light on the mechanism of ignition.

WE SHOULD DEVELOP and maintain the co-operation of our workmen and convince them that they are largely responsible for their own safety and that their co-operation is needed to prevent accidents. It is our duty to make safety activity an integral part of all operating policies and methods and in reality to make it an operating function, to provide an opportunity for the free discussion of safety problems and the advancement of ways and means for accident preventions, and to improve at every opportunity the co-operative spirit between ourselves and our employees.—From a monthly safety report of the Old Ben Coal Corporation.

Is Return to Gold Standard Responsible For Plight of British Miners?

Winston Churchill's Currency Stabilization Program Involved Indirect Effects Grossly Underestimated by British Government And Put Heavy Burden on Coal Industry in Deflation Movement

By Robert Murray Haig
Professor, School of Business, Columbia University, New York City

DURING the twenty months since Churchill announced the return to the gold standard, the labor situation in Great Britain has developed to an acute stage. The short and dramatic general strike in May and the long and tedious coal struggle which has dragged its weary course throughout the summer have concentrated attention upon the labor problem as one of the most important heritages of the war in Great Britain. In the current discussion of the business and financial situation, the adjustment of the labor situation is the central theme.

This is in striking contrast with the situation in America. We have, indeed, not been entirely free from industrial disturbances, but our troubles have been incidental. With England they are fundamental. It is not the purpose to survey differences in the situation of the two countries. These differences are manifold and most of them are both familiar and obvious. It is rather the desire here to call attention to certain unfavorable factors of a deep-seated character which are at work in the British situation, factors which are either not present at all with us or are present in a relatively slight degree.

THE AMERICAN coal industry has not been free from troubles of an industrial nature, but, whereas the difficulties in this country have been incidental, in Britain they have been fundamental. It is somewhat questionable if, in the language of a former presidential candidate, the English miner is not being "crucified on a cross of gold." At least much of his difficulty arises from the return to the gold standard.

Perhaps the most important of these factors, if not familiar and obvious, is, nevertheless, one whose import and significance should be readily grasped by a generation of American business men whose memories reach back as far as Bryan's 1896 campaign. It is the old "hard money" question in a different form. Are the British miners the victims of deflation? In Bryan's grandiloquent phrase, are they being "crucified on a cross of gold"?

It will be recalled that the return to the gold standard was accompanied by the most elaborate safeguards on the financial side. Restrictions were placed upon loans to other countries to conserve resources in London and care was exercised that the public revenues should be clearly adequate to meet the budgetary estimates of expenditure so as to obviate embarrassing Treasury operations in the loan market. Finally arrangements were also made with J. P. Morgan & Co. and the Federal Reserve Bank of New York for large provisional credits to support the exchange market in case of undue weakness in the rates. These financial arrangements proved to be entirely adequate. Great Britain moved to the gold standard. The rate of exchange was stabilized. The old gold points became once more effective. On the purely financial side the measure was a clean-cut success, with small direct costs.

It was realized, of course, that the operation involved risks of heavy indirect costs. A discount rate placed at an artificially high level to attract deposits of foreign gold would amount to a tax upon domestic borrowers and tend to depress business activity. Prices reduced to the true gold level in order to sell in the world markets might involve an elimination or a reduction in profits, and consequently a readjustment of costs of production including wages, with all attendant distress. It was impossible accurately to forecast such costs but the statistics of prices and exchange rates at the time appeared on their face to justify the belief that such costs would be low and that the operation would involve little deflation. Subsequent events, including the present coal muddle, seem to indicate that these indirect effects were grossly underestimated.

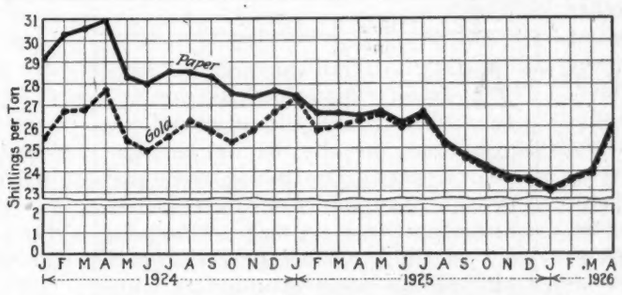
Turning now to the coal situation, the industry at the time of the resumption of specie payments in March, 1925, was already in a bad way. It was operating under a national wage agreement entered into the preceding June, and as early as November, 1925, the owners had initiated an investigation by a joint committee of themselves and the workers, alleging as their major contention that the reduction of hours from eight to seven, accomplished in 1919, was making it impossible to compete effectively in the world market. This joint committee got nowhere and late in June, 1925, notices were given terminating the wage agreement on July 31.

It was at this stage, on July 13, that the Minister of Labor appointed a Court of Inquiry of three members. A fortnight later this court submitted a brief report (Cmd. 2478) which has received little notice in America. This report resulted directly in the appointment of the Samuel coal commission whose recommendations have formed the foundation of the government's policy during the strike, but its chief interest here lies in its illuminating diagnosis of the underlying causes of the dispute.

It is a temptation at this point to digress in order to comment upon the high cost of holding economic advice in low esteem. One need not go to the extreme of supporting the position of J. M. Keynes who held that in England costs of deflation were so great that the game was not worth the candle and that stabilization should have been effected on the inflated basis. Even so conservative an economist and business man as Sir Josiah Stamp had issued a warning (*The Times*, March 3 and 27, 1925) that even the preparatory steps

for the return to the gold standard would cause a "painful reaction" to industry. His position was that the country should by all means return to the gold basis, but that care should be taken in selecting the time and in making the arrangements in order that the indirect costs might be minimized. However, depending upon the advice of the "practical" bankers and the superficial evidence of the price indices and the exchange rates, the government proceeded with its plans for returning to specie payments, without making any special preparations whatsoever to meet any but the direct financial costs of the process. In so doing they cannot claim to have been unwarned by the economists.

When in July, 1925, the time came for government action in the coal crisis, the Minister of Labor turned to Sir Josiah Stamp, appointing him, together with Messrs. H. P. Macmillan and W. Sherwood, to the Court of Inquiry mentioned. The main body of the court's report, signed by all three members, contains a brief but admirable statement of the principal issues in the dispute. The wage difficulty is found to rest upon the "deplorable condition of the industry." One of the reasons for this condition is decreased demand, traceable to (1) decreased purchasing power of foreign customers; (2) the growth of the use of substitutes, such as oil and electricity; (3) increased coal production in countries which were formerly good customers and (4) underselling by competitors. The relatively high costs which make this underselling possible are said to be due to a variety of causes.



How Return to Gold Standard Affected Prices

This chart shows the average monthly prices on best Welsh Admiralty coal for the twenty-eight months ended April 30, 1926, and illustrates during 1924 and early in 1925 the wide spread in the returns actually received in paper shillings under a depreciated currency with the true returns as expressed in gold standard shillings.

In the court's opinion, there was "room for improvement in the management, organization and development of the industry." Improvement here might be expected to increase the power of the industry to pay wages. A change in the basis of the royalty system would at least eliminate a source of ill feeling among the workers. A reversion to the former hours of labor "would result in a substantial increase of output and some diminution in working costs per ton, the extent or effect of which we do not find ourselves in a position to predict with assurance."

But after all was said and done, it was plainly indicated that there remained an important gap between the "economic" wage which the industry seemed able to "afford to pay" and the "social" wage which the workers could be "asked to accept." With ten per cent of the population directly dependent on the industry for a means of livelihood and with British commercial and industrial life largely dependent upon its product, the court asks "whether the coal industry is one whose fate from a national point of view can be left to be determined by the unmitigated operation of purely economic forces." The answer to this question is, of course, found in the coal subsidy—now discontinued.

At the end of the court's discussion appears the following significant paragraph:

> Sir Josiah Stamp, a member of the court, considers that the situation is not fully explained without reference to recent national financial policy. This aspect of the case was only incidentally referred to in evidence, and the two other members of the court do not feel themselves qualified to deal with it. We have accordingly printed a separate addendum on the point for which he alone is responsible.

In the addendum, which is the most valuable part of the report, Sir Josiah speaks his mind. Disavowing any desire to bring current political issues into the report, he nevertheless refuses to avoid reference to significant factors "merely because they do not act on the surface, and still less because they may lie for the moment in that political field with which I have usually no concern."

> In my own judgment, with all due appreciation of the virtues of the gold standard, as such, it was always open to doubt in the period January to March, 1925, whether its introduction would not involve a considerable degree of actual deflation, either at the moment of introduction, or the period prior thereto (during which such action was being anticipated), and whether such deflation would not inevitably be so one-sided in becoming effective as to cause much industrial unrest. The position of the dollar-sterling exchange, as such, lent color to the superficial view that the degree of deflation necessary to make the gold standard effective would be small, but I had always the underlying feeling that special causes relating to money rates in London designed to retain foreign balances here, together with that false appreciation due to anticipation, masked the true relative position of the British sterling price level and the world gold price level.
>
> The actual "step down" as indicated by the exchanges appeared small, but the real "step down" judged by relative price levels seemed likely to be severe. But the figures of the exchange situation are known immediately, whereas the price level position is known only some time after the date to which it has related. . . . There were indeed criticisms that the one thing wanted in order to secure more trade was a reduction in our prices, but it was clear that the considerable reduction in sterling prices (now gold prices) in a neutral market would cut out the margin of profit on exports unless we were prepared to reduce the cost of industry at home, *including wages*, in accordance and simultaneously therewith; that *simultaneous* restatements in terms of money of all the values entering into new production and commerce was necessary if their relative proportions were not to be violently disturbed; and that as such adjustments in the case of wages would be, from the human standpoint, with so much unemployment, very difficult, we should still probably have to quote prices abroad that would be above the competitive level. But recent weeks have increasingly indicated that . . . a considerable measure of deflation was, in fact, involved. . . .
>
> It ought to be obvious that those of our exports on which there are fine margins in close competition would be the first to feel the pinch. The coal industry, starting from the point of having little margin of profit at all into which to cut, would readily be put into serious difficulties. Moreover, coal is sensitive to foreign competition to a peculiar degree, because it not only suffers its own direct troubles in a curtailment of exported coal, but it feels the reduction in other classes to exports, such as iron and steel, in the most immemediate and direct way. In my view, therefore, the recent improvement in the exchange or decline in the price level to which I have referred, whether or not compulsorily brought about by the anticipation and

then the realization of the gold standard, is sufficient in itself to account for the special plight of the industry since March.

There would appear to be no way in which the competitive position of coal prices can be restored unless and until (a) the costs in this country are reduced, or (b) the gold costs of the other competitive countries are raised, either by gold inflation there, or by less efficiency, shorter hours and higher wages abroad. . . . I am, therefore, obliged to conclude (a) that whatever the effect of the operation of the present agreement might be upon the industry in the long run, it was bound to be made substantially worse by that kind of one-sided deflation which has taken place, and (b) that no other satisfactory or sufficient cause appears to be available, though I give full weight to the general depression in coal consumption abroad.

In addition to his indictment of the one-sided deflation, Sir Josiah advances another suggestion, with a less degree of confidence, it is true, but in the belief, nevertheless, that it "may not have been without its influence." This suggestion is that the limitation of foreign borrowing on the London market, one of the positive financial measures adopted to aid the return to the gold standard, may have operated to accentuate the depression in the coal industry and to make it more difficult to compete in the international market.

ALTHOUGH the actual "step down" that marked the resumption of the gold standard, as measured on the exchange, appeared small, the havoc wrought by the changed conditions seems disproportionately large. The policy of the government is largely blamed, by some economists who should be in a position to know, for the present plight of the English coal industry.

If we have either in fact, or artificially by such an arrangement less money to lend abroad, it is to be expected that our whole export trade would feel it, and, moreover, that that sensitive end of our exports, consisting of coal, should be rapidly affected. The situation is not materially different if we are buying far more than we are selling and balancing the account by increased borrowing from abroad. For these reasons I do not think the state of affairs in the coal industry in the last few months must be regarded as the necessary result either of normal trade movements or the present agreement. Currency policy has aggravated the evil.

Such doctrine must have been anything but welcome to the government. One can imagine the degree of enthusiasm with which Winston Churchill read these paragraphs. If the position here taken is sound, the government was really in a measure directly responsible for the difficulties in the coal industry and would consequently appear bound to assume the burden of alleviating the situation. It is not to the credit of the leaders of the miners that they did not take greater advantage of the opening thus provided them.

An examination of the voluminous Samuel's report (Cmd. 2600) reveals little that aids in an understanding of the situation beyond what is suggested at least in the brief report of the Court of Inquiry. The Samuel's report dismisses the Stamp indictment with two sentences:

Nor could we expect to escape a temporary ill effect upon all branches of our export trade at the time of the restoration of our own currency to a gold basis. But it may be believed that this effect has now spent itself.

It is indeed difficult to follow the commission to this conclusion. It would certainly appear to be probable that the economist of the future who writes the post-war economic history of Great Britain will be forced to consider the present coal strike among the indirect costs of the government's currency policy and will include it among the liabilities in the balance sheet by which the ability of Winston Churchill will be measured.

If this view be correct, the miners are really struggling against forces far greater than they realize. "Not a penny off the pay; not a minute on the day" is a motto which, in the absence of increased productive efficiency, is singularly unfitted to deal with the phenomenon of deflation. The British coal strike may be settled before these words are in print. To some extent it will almost certainly be settled by the abandonment of many of the poorer mines. This means an accentuation of the problem of readjusting the labor supply. The more remote effects upon British industry may be very serious indeed.

The immediate effects upon industry of the coal stoppage have not been so marked as many prophets anticipated. The wheels have been kept going to a surprising extent. Some coal is being raised—but not much, scarcely one-third of the amount required for the operation of the railroads alone. Imported fuel is being widely used. Coals are being "carried to Newcastle," but at a cost which has sent sharply upward the price index for those groups of commodities which require coal for their fabrication. This, of course, involves further trouble for the exchange situation.

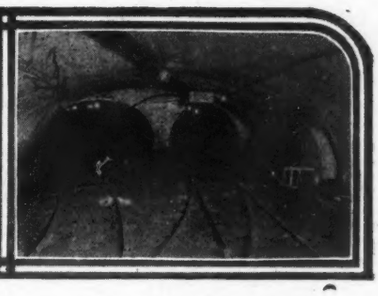
It is to be hoped that Great Britain may be more fortunate in dealing with any deflation which remains to be accomplished than she has been in the case of the coal industry. Otherwise the indirect costs will amount to truly staggering totals.

Workmen's Organizations

"Except in the anthracite industry," says Capt. F. Walton Brown in *Colliery Engineering*, "the proportion of miners who are members of the miners' union does not appear to be so high as in Great Britain. We had the advantage of discussing some of the problems of the industry with officials of the miners' union, and they did all they could to answer our questions and supply us with information. They appeared to be more concerned with the maintenance of the present high standard of miners' earnings rather than help the management with other conditions, and in this respect their position is worthy of every consideration. An impression may prevail that in America non-union mines invariably pay lower wage rates than union mines. This was the case in some instances, but we also found examples where the non-union scale was as much as 10 per cent above the union scale. It is also interesting to note that certain coal mines are owned and worked by members of a union of another industry, and in this case the mine is run as a non-union mine and the full rate prevalent in union mines are not paid."

THE RATING AT WHICH a boiler can be operated depends primarily upon the amount of coal that can be burned upon the grate, and this is determined by the size of the grate and the draft available. The limit is reached when the draft will bring no more air through the fuel bed, or when an excessive amount of labor, involving an expense too high for practical operation, is required to keep the fuel bed in condition for air to get through. The practice of expressing the performance on the basis of per-cent rating developed is not accurate. Abstract of bulletin No. 26, Purdue University, reported in *Power*.

Underground Operation

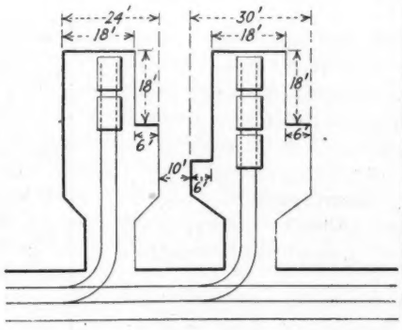


Can Load Two Cars per Turn By Leaving Side Slab

At its No. 2 mine the Black Diamond Coal Mining Co. gathers coal from its working faces by electric locomotives. The mine is worked on the room-and-pillar method, with rooms 24 ft. wide and 250 ft. long, leaving 10 ft. of pillar between rooms. Eighteen rooms are driven on both sides of each pair of panel or stub entries. The mine cars hold from 2 to 2½ tons.

After weighing many methods for loading more than one car in a room per trip of the gathering locomotive, the mine management acting on the proposal of Harry Mills, mine manager, finally adopted the method shown in the accompanying sketch.

As shown, the track is laid in the center of the room. On one side the face cut is carried to a width of 18 ft.,



Room Slabbing

Two and even three cars can be collected by the locomotive each trip without uncoupling, thus reducing the labor of gathering and also enabling the locomotive to return to the parting with minimum delay. This also makes it possible to get large tonnage with minimum development.

and on the other side 6 ft. of coal is temporarily left solid. After three cuts have been made on the 18-ft. width, the 6-ft. slab, now approximately 18 ft. long, is undercut and shot down at the same time as the fourth cut at the face. From this point on, two cars at a time are spotted in the rooms.

By loading the front car and as much as possible of the rear one from the face cut and finishing the rear car with coal from the end of the slab, the miners can keep their places in such condition that they can load two cars practically at every trip.

This simple change in the method of working the rooms has enabled the mine management to increase output with a smaller number of working places and with much less effort on the part of the gathering locomotive crews.

One main-line and five gathering locomotives are producing an output of about 1,200 tons. Should one locomotive be out of commission the production is not appreciably lowered showing that the locomotives can produce a large tonnage without being pushed to their limit as was necessary when each room afforded only one car per trip.

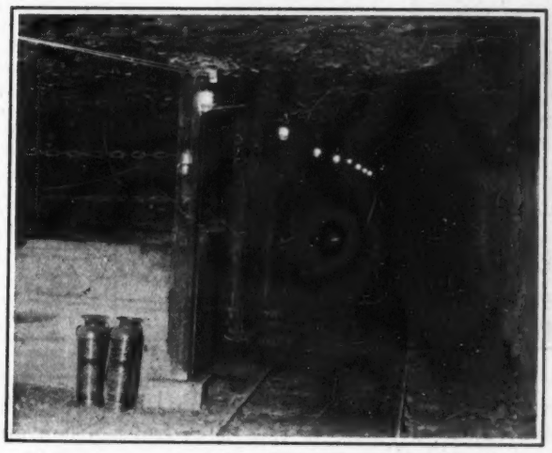
Modifications and possible improvements of this method suggest themselves. Where roof conditions permit the driving of rooms 30 ft. wide, a 6-ft. slab could be carried on each side providing an 18-ft. face. A 27-ft. room, using a 15-ft. face would also give a double slab and would permit of the loading of three cars.

LEAHY & BYERS,
Central City, Ky. Mining & Civil Engineers.

Pipe Delivers Air to Rear of Mule Stable

As it is desirable at the underground mule stable of the Navajo, No. 5, mine of the Gallup-American Coal Co., Gamerco, near Gallup, N. M., to carry the intake air to the far end of the stable, a 16-in. canvas tube is used which is supplied with air under the normal pressure of the mine. No auxiliary fan is used or needed to provide this ventilation. The pipe is put near the roof as the illustration shows. It is thus out of the way of the stable attendant.

For protection against fire the surrounding pillars have been heavily coated with gunite. It appears to have given excellent service, binding the ribs together, for they are quite friable. The partitions between the stalls



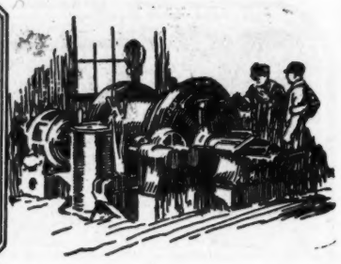
Underground Home of Twenty-Five Mules

The walls between stalls are of concrete, the coal ribs are carefully gunited and the posts are of steel. Only the mangers and the floors on which the mules lie are of wood. Note the 16-in. canvas duct on the right which carries air under mine pressure to the rear of the stable. The two extinguishers in the foreground are available for fire fighting.

are of concrete, and the stall posts are of steel. Only the mangers and the floors on which latter the mules lie are of wood. The mine is a shaft working, 765 ft. deep, so the mules are kept underground.

The stable roof needs no support as the location for the stable has been discriminatingly chosen in a part of the mine where the immediate cover of the coal is a coarse conglomerate. That type of roof at the Navajo No. 5 mine has always been found to stand well. It does not break posts and fall as does the shale roof in adjacent workings.

Practical Pointers For Electrical And Mechanical Men



Flexible Fire Ring Aids in Removing Locomotive Tires

In the accompanying illustration is shown an L-section sheet iron ring housing, which may be fitted around a locomotive tire that is to be removed from a wheel, in such a manner as to confine the heat of a kerosene torch. The periphery of this housing is hexagonal in shape. All joints between segments are pinned together with one exception. This unfastened joint provides an opening to the interior of the housing and allows it to be straightened out or rolled up like a belt for transportation or storage. If desired, this device can be covered over with earth so as better to retain the heat. Its greatest attribute is that it provides a convenient and immediately available heating arrangement for the removal of a tire.

Ring in Use

This housing consists of six straight L-sections of sheet iron, hinged together so that they can be quickly curved around a locomotive tire that is to be removed. Heat is applied to the interior by means of a kerosene torch which projects its flame through the small gap between the two end segments.

Power Consumed by Loading Machines Averages Half Kw.Hr. Per Ton

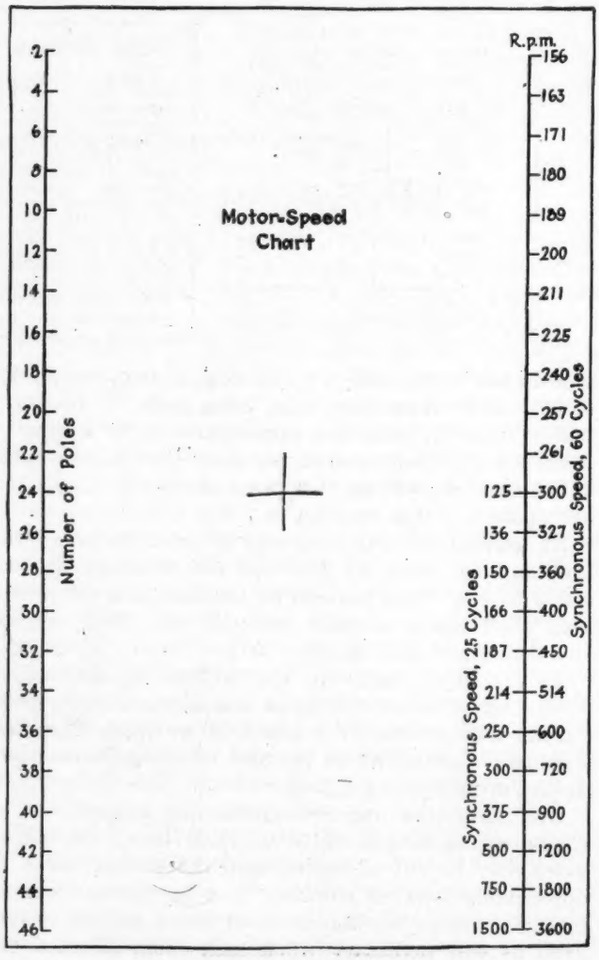
At an Illinois mine, where loading machines are used extensively, it was desired to determine approximately what portion of the per-ton direct-current power consumption is chargeable to these loaders. Accordingly, indicating meters were connected in the circuit and readings taken at short intervals during the filling of four cars. This was done with one of each of the two types of loaders in use.

The first test, on a machine of the type which loads from the track, gave results of 0.43, 0.33, 0.25, and 0.46 kw.-hr. per ton. The average for the four cars was 0.37 kw.-hr. Results of the other test, which was on a machine mounted on caterpillar treads, were 0.58, 0.66, 0.68 and 0.63 kw.-hr. per ton, the average being 0.64 kw.-hr.

The average for the two types of machines is 0.5 kw.-hr. per ton. The higher power requirement of the caterpillar-type machine was probably due to its particular type of advance and swinging motion. The tests did not include any travel of the machines other than the small movement while loading a car.

Chart for Finding Speed or Number Of Poles in a Motor

When making speed changes, and on other occasions, it is often necessary to determine the speed or number of poles in which the stator of an induction motor is wound.



Motor Speed Chart

To determine speed of motor place straight-edge on number of poles and on center of cross and read speed on right-hand column. For number of poles, place straight-edge on synchronous speed and center of cross and read number of poles on left-hand column.

If the frequency and either the speed or number of poles are known the other value may be found by means of the accompanying chart, by Chas. F. Cameron, and published in *Industrial Engineer*. This was drawn up to show the relation between the number of poles and the synchronous speed of induction motors operating at 25 and 60 cycles.

This chart is based on the formulas, $P = (120 \times F) \div$ r.p.m., and r.p.m. $= (120 \times F) \div P$, in which P equals number of poles, F is the frequency and r.p.m. represents the revolutions per minute.

When using the formula first given to determine the number of poles, the synchronous speed should be taken. The full-load speed must not be used, because it is appreciably less than the synchronous speed and thus will not give a whole number of poles.

When using the chart to determine the number of poles, place a ruler or straight-edge on the synchronous speed shown in the right-hand column and on the center of the cross, and read the number of poles that is indicated in the left-hand column.

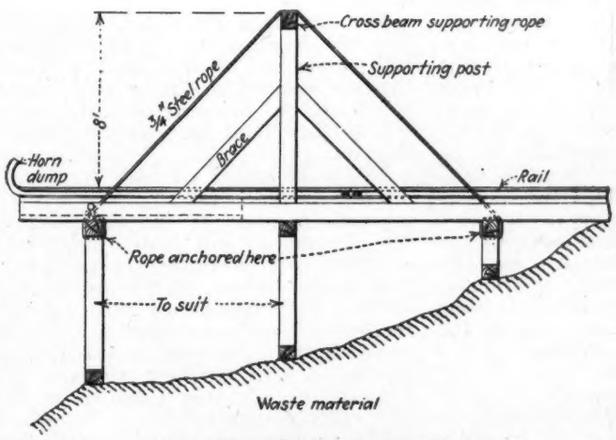
Should it be desired to find the speed with a given number of poles, place the ruler on the figure representing the number of poles and on the center of the cross, and read the speed of the machine on the right-hand column.

Prevents Settling of Rock Dump

Around many mines it has been observed that approaches to rock dumps have a tendency to pitch toward the dump on an inclination of from ½ to 2 per cent, on account of placing the forward bent on loose material and providing no way to keep it from settling. This difficulty has been effectually overcome at the Beard's Fork mine of the Loup Creek Colliery Co. by the simple and ingenious arrangement of placing the dump on a kingpost truss shown in the accompanying illustration.

Rock cars are usually placed by the motor on the switch and are then pushed to the dump by hand. By keeping the track level, runaways are eliminated and the return of the empties which must also be accomplished by hand is made much easier.

U. J. COOK.
Technical Representative,
Du Pont Powder Co.



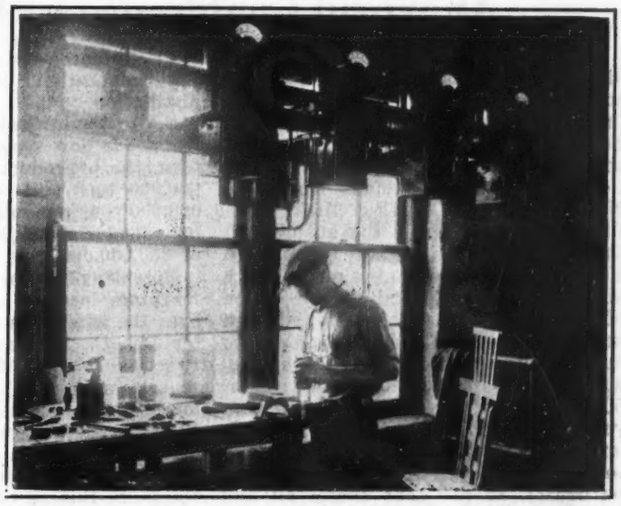
Steel Rope Takes the Shocks

Dumping stresses are taken by the cable. This cable, from its anchorage, passes over the king post to the tilting dump thus taking the weight and shocks occasioned by the discharge of cars off the forward bent of the supporting structure.

Mounting Accommodates Switches

One important detail in the design of motor circuits, with a view to minimizing interruptions, is to split the feed into several parts, and to provide a convenient means of disconnecting any one in which trouble may develop. This is illustrated by some recent changes made at the Dehue, W. Va., mine of the Youngstown Sheet & Tube Co., involving the installation of several oil circuit breakers in 220-volt alternating-current feeders.

Originally the feed from a bank of 2,200/220-volt transformers, at No. 1 tipple, was a solid network. When an aerial tramway was installed for slate disposal, it became necessary to have more transformer capacity. This was provided by three larger transformers, which



Circuit Breakers Mounted Overhead in Lamp House

With this mounting the breakers take up no floor space yet the operating handles are within easy reach. The transformers are outside and close to the windows. A part of the lamp rack may be seen at the right, and the charging set is in the corner back of the chair. The lamp man is in the act of unlocking a flame safety lamp at the manget mounted on the bench.

were installed on a concrete base in a fenced enclosure beside the lamp house.

Four 220-volt three-wire circuits were run from the transformer bank to the motor groups, and oil circuit breakers with overload trips were connected in each circuit. These breakers are shown in the accompanying illustration. One supplies the machine-shop motor and the hoist for handling material on a slope, another, the 50-hp. motor of the aerial tramway, a third, the tipple motors, and the fourth, the pumps at the bottom of the main shaft.

When the question arose as where to locate the breakers, the lamp house was suggested as the logical place because it is near the center of distribution and has constant attendance. But there seemed to be no space in the room for the breakers, if mounted at the usual height. This difficulty was overcome by placing them just high enough to be overhead, and yet low enough so that the handles can be reached from the floor.

On the top of each switch is an ammeter. The application of this meter makes each unit practically equivalent to a switch panel of a distribution board, but at a much smaller cost. The ammeters are useful in indicating normal loads, but perhaps their greatest function is that of indicating on which circuit any abnormal action takes place, as well as showing the extent and nature of the trouble.

News Of the Industry

Sees Partial Solution of Coal Problem In Distillation; Research Fund Urged At World Conference in Pittsburgh

That the world cannot hope by the distillation of coal to get the needed supply of oil if present natural sources fail was the declaration of Dr. Friedrich Bergius, of Heidleberg, Germany, at the opening sessions of the Interational Conference on Bituminous Coal held Nov. 15 at the Carnegie Music Hall, Pittsburgh, Pa., under the auspices of the Carnegie Institute of Technology. He said that by the mixing of coal with oil to form a paste and the subjection of this mixture to action with hydrogen under a pressure of one hundred or two hundred atmospheres and at a temperature of 400 or 500 deg. Cent. about 50 per cent of the coal would be converted into oil. As much as 140 gallons of oil could be obtained from one ton of coal, 15 per cent of which would be benzol, 15 per cent Diesel oil and creosote and 20 per cent fuel oil. Of the other 50 per cent 8 would be water, 20 gas, 11½ organic matter insoluble in benzol and 10 per cent ash.

With low-temperature distillation 4.4 per cent would be fuel oil, 4½ per cent Diesel oil and 61 per cent semi-coke. This distillation will help solve the coal problem but not that of oil supply. The address of welcome was delivered by Dr. Thomas Stockham Baker, president of Carnegie Institute of Technology, who said that this was the first international coal meeting.

Large Part of World Supply Here

Marius R. Campbell, U. S. Geological Survey, Washington, D. C., outlined the coal supply of the United States, its quantity, quality and distribution. He said that it was estimated that this country has 52 per cent of the coal of the world, but many estimates of the coal in remote parts of the universe were mere guesses. Further inquiry doubtless would reduce the relative importance of our national supply.

Dr. Cecil H. Lander described "British Research on Fuel Utilization," showing that the British are not merely analyzing coal to discover the average percentage composition of the commercial coal in the various beds mined but were making careful investigations of the different layers of coal in each seam to ascertain their action in promoting spontaneous combustion and other properties. They also are determining the availability of different coals for various industrial purposes. Furthermore, the Department of Scientific and Industrial Research is making large-scale experimentation in low-temperature distillation.

S. A. Taylor said that the utilities had made power savings of 100,000,000 tons, the byproduct coke plants of 50,000,000 tons and the railroads of 30,000,000 tons annually. Concurrently oil had displaced 200,000,000 tons, a total of 380,000,000 tons per annum.

President Baker presided over the morning meeting and Samuel Insull over the afternoon session. In the latter A. C. Fieldner spoke on "The Practical Value of Fundamental Research on Coal." This session was followed by animated discussion on the Bergius address, which was the final paper of the day.

Mr. Fieldner, who is chief chemist of the U. S. Bureau of Mines, presented a program for fundamental research on coal, and urged the raising of a $4,000,000 endowment fund, from which the annual income of $200,000 should be spent in research.

Mining Congress Convention And Exhibit in May

The board of governors of the Manufacturers Division of the American Mining Congress, comprising producers of mining machinery and equipment, at a meeting in Washington last week considered plans for its next annual exposition and convention. It was tentatively decided to hold these events in May, 1927, and a committee consisting of H. K. Porter, of the Hyatt Roller Bearing Co., of Newark, N. J.; J. F. Callbreath, of Washington, D. C., secretary of the American Mining Congress, and J. C. Wilson, of the Ohio Brass Co., of Mansfield, Ohio, was appointed to select the convention city.

The Mine Safety Appliances Co., of Pittsburgh, was received into membership in the Manufacturers' Division.

Others attending the meeting were C. L. Saunders, Morse Chain Co., Ithaca, N. Y.; Chas. Whaley, Myers-Whaley Co., Knoxville, Tenn.; L. W. Shugg, General Electric Co., Schenectady, N. Y.; F. J. Maple, John A. Roebling's Sons Co., Trenton, N. J.; H. A. Buzby, Keystone Lubricating Co., Philadelphia; C. R. Delamater, W. S. Tyler Co., Cleveland, and Rex Martin, Link-Belt Co., Chicago.

Suggests Four Days' Work In Five-Day Week

A five-day week, consisting of four work days and one holiday, is urged as the ideal arrangement for industry by Dr. Walter N. Polakov, consulting engineer, of New York City. This scheme was suggested in an open letter to William Green, president of the American Federation of Labor, commenting on Henry Ford's plan for five work days in a seven-day week.

The number of work days would be reduced by this scheme from 313 to 292, but there would be no real loss in yearly production, in the opinion of its sponsor. Dr. Polakov declared that the experiment of a shorter work week had been tried out by him between 1912 and 1914 in the Penn Central Light & Power Co. in central Pennsylvania.

Reading Lease of L. & N. E. Tentatively Approved

The Reading Company's proposal to lease the Lehigh & New England R.R. was approved tentatively Nov. 12 in a preliminary examiner's report submitted to the Interstate Commerce Commission. In spite of objections to the proposal by some of the trunk line railroads, including the Pennsylvania, C. V. Burnside, the Commission's assistant director of finance, who considered the evidence, recommended that the Commission allow the application.

The examiner stipulated, however, that the Reading should be required to hold the line of the Lehigh & New England open in so far as it is open at present for co-operation with other railroads in joint shipments to New England.

The predominant question of public interest in the situation, in the examiner's opinion, is in maintaining the efficiency of rail routes into New England from territory southwest of New York Harbor. Rail routes north of New York Harbor are becoming of increasing importance because of traffic congestion, he held, and the line of the Lehigh & New England is consequently of great value to trunk line railroads generally.

The proposed consolidation would be productive of economy in general railroad operation and in accordance with the spirit of federal legislation providing for railroad merging, it was held.

Early Settlement of British Strike Seems Likely When South Wales Men Unexpectedly Agree to Peace Program

Prospects of an early termination of the British coal strike appeared brighter at the beginning of this week than at any time since the miners walked out on May 2.

Delegates to a conference of the British Miners' Federation, meeting in London, voted on Nov. 13 to recommend acceptance of the latest peace proposals put out by the government. This recommendation, passed by a vote of 432,000 to 352,000, was adopted in the face of strong opposition from A. J. Cook, general secretary, and delegates from the Yorkshire and South Wales coal fields.

On Monday of this week, however, the executive council of the South Wales Miners' Federation sprung a surprise upon the country by agreeing to the peace program. With this field, heretofore regarded as the home of the die-hards among the miners, yielding to economic pressure, it is considered likely that other districts will lose little time in accepting the terms denounced by "Emperor" Cook as "the most abominable ever put before a body of men."

Modified Proposal on Arbitration

As finally set forth in a letter from the Secretary of Mines to the coal owners, the government made a limited restoration of the proposal to establish a national arbitration tribunal. This tribunal, however, would sit only for six months and its jurisdiction would be confined to hearing appeals from either side against district agreements which complainants claimed did not conform to the national standards.

The other major provisions of the proposed settlement are:

District settlements ignoring the seven-hour day;

Standard district agreements for periods of not less than three years;

Allotment to the owners of not less than 13 nor more than 15 per cent of the net proceeds of the industry.

The many recommendations of the Royal Coal Commission for a technical and commercial reorganization of the industry go by the boards in this new plan.

The virtual abandonment of the fight by the miners' leaders is undoubtedly due to increasing desertions from their ranks and their inability to enlist the aid of other unionists in checking the flow of coal into Great Britain. The most recent estimate of the number of men who have returned to the pits to make whatever terms they could with the coal owners placed the number at 300,000, or close to 30 per cent of the total number of workers normally employed in the coal industry of Great Britain.

While the strike has cost England vast sums industrially the strikers never have succeeded in cutting off the essential transport services or the operations of the public utilities. These have been supplied with coal from the United States, Germany and Poland. Shipping, of course, was hard hit and the great export trade in coal reduced to the vanishing point. But the country seemed willing to accept the burdens of the suspension without crying for an armistice which would involve a political surrender or the revival of the subsidy.

Although the program reluctantly approved by the majority of the delegates to the London conference last week denies them everything for which the strike was inaugurated, there is a possibility that the owners may balk at the terms of the settlement. Protests already have been made by the employers against some of the peace provisions. The government has intimated, however, that it will ignore these objections and, if the coal owners refuse to go along with the program, will enact the necessary legislation to give it effect.

Complete returns on the district voting on the peace plan probably will not be known until the end of the week.

P. & A. Photos

Foreign Coal Loaded Into Cars on London Sidings

Shipments of American coal to Great Britain have increased to an extraordinary extent with the miners' strike now well in its seventh month. The above picture shows a cargo ready for shipment inland from one of the London docks.

Coal from Arctic by Air, Says Byrd

Coal will be hauled from the Arctic regions to the United States in airplanes before forty years have passed was the prediction made in Chicago Nov. 13 by Lieutenant Commander Byrd, first aviator to fly over the North Pole. His prediction was based, he said, upon the premise that advances in airplane construction would soon insure the production of flying machines of almost absolute safety and stability for heavy commercial use.

Commander Byrd expects in the near future, probably next summer, he said, to fly again to the Arctic regions and claim for the United States some million acres of uncharted land north of Siberia and Alaska, where, it is thought, there are many rich coal fields.

Bewley-Darst and Holmes Firms Merged

Consolidation of the Bewley-Darst Coal Co., of Knoxville, Tenn., and the Holmes Coal Co., of Cincinnati, under the name of the Holmes-Darst Coal Co., has been announced by Calvin Holmes. The new company will market coals from the Hazard district and southeastern Kentucky and from Virginia. Its total distribution will be more than 3,500,000 tons a year.

The Bewley-Darst company was organized in 1907 and later became a corporation owned by Guy Darst, of Knoxville; Jake Bewley, of Bristol, Tenn.; E. P. Avent, of Spartansburg, S. C., and E. P. Avent, Jr., of Cincinnati.

Calvin Holmes formerly was sales manager of the R. O. Campbell Coal Co. and later was a partner in the Bewley-Darst company. In 1916 he resigned to become vice-president of the Blue Diamond Coal Co. and several years ago he sold his interest in the Blue Diamond companies to organize the Holmes company.

Mr. Holmes will be in charge of sales of the new corporation with offices in Cincinnati and Mr. Darst will have charge of the financial headquarters at Knoxville. Mr. Bewley will give up active interest and Mr. Avent, Jr., and W. K. Barrett, Jr., will assist with sales in the North. Mr. Avent, Sr., will have charge of its interest in the Carolinas.

Open-Shop Wage Advances Hailed by John L. Lewis As Victory for Union

Officials of the United Mine Workers profess to see a victory for the union in the recent action of open-shop mine operators in voluntarily raising wages on Nov. 1 to the approximate level of the Jacksonville agreement — in one instance above it. John L. Lewis, president of the union, calls it a recognition by these operators of the economic sanity of the terms of that pact.

"The fact that these operators have returned to the scale proves that they can make money under the Jacksonville terms, which they avowed when they broke their contract would precipitate bankruptcy." said Mr. Lewis.

"They employed men entirely inexperienced in mining and followed their first wage cut with more drastic ones. Some workers, formerly of the cotton fields and mountains, were paid as little as $1.75 per day.

"The return of these operators to the union scale is an admission by them that they could not produce profitably under the conditions they chose. Their overhead cost of operating remained the same, and their production was sharply reduced. That they are producing now under the Jacksonville scale proves our contention that there was no good reason in the first place for any reduction."

To Reorganize District 17

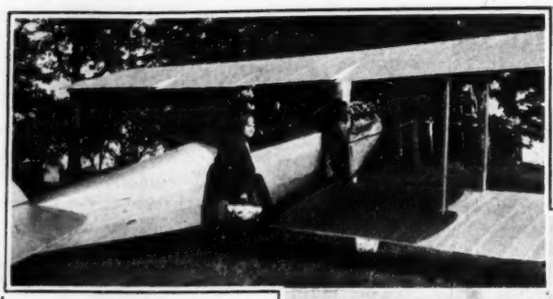
Considering this a propitious time to reorganize District 17 (southern West Virginia) the union, through Percy Tetlow, president of that district, has notified heads or former heads of various locals in the Kanawha field of their plan to begin a campaign to rehabilitate the organization in that region.

Circulars were sent to the former officers and members of the various locals calling attention to "important events taking place in the coal industry," which were named as increasing production and improving market prices for output.

"The time for action is now," the circular points out, and officers of the locals are called upon to organize. There has been nothing but a skeleton organization in District 17 for some time, for last February Percy Tetlow, provisional president, issued a public statement advising the miners to go to work in the non-union mines until the coal business improved, when, he said, reorganization would be undertaken.

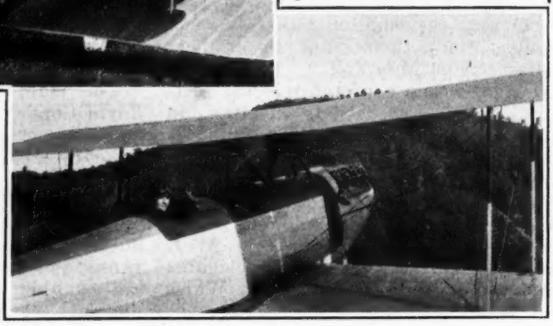
The Tug River Coal Operators' Association, in session in Bluefield, W. Va., voted a substantial advance in wages for all miners in the Welch section. This means that all the operators' associations of southern West Virginia have announced increases. The amount of the increase granted by the Tug River operators was not made public, but it is understood to be in line with increases allowed by the Kanawha, Winding Gulf and New River associations. The increase is effective as of Nov. 1 and will continue with the present market.

Five hundred miners, claiming to represent 15,000 workers in Bell and Harlan counties, eastern Kentucky, met in Pineville, Ky., Nov. 11 and passed resolutions in which they petitioned John L. Lewis, president of the United Mine Workers, to launch an intensive campaign for unionization of the field. The miners contend that the operators are receiving war-time prices for their coal, and that they have given the workers "only a few crumbs." The petitioners demand a return to peak wages.



C. A. Griffith Leaving His Home

The vice-president and general manager of the Pruden Coal & Coke Co. lives in Knoxville. This "Waco" takes him to the mine at Pruden in 3½ hr. less than by train.



Forty-five Minutes Later

Picture at right, showing Mr. Griffith on the landing field at Pruden, was made on the same trip as the one above showing him stepping into the plane at his home.

It has been denied in mining circles at Madisonville, Ky., that practically all of the miners in that section have become affiliated with the United Mine Workers in an effort to reorganize Hopkins County. It was officially announced that the West Kentucky Coal Co., the Hart Coal Co. and the Reincke Coal Co. had discharged a total of 40 men who had affiliated with the union. These are the largest producers in Hopkins County. Miners employed at small mines in the county have joined the union, according to reports, but a careful investigation reveals that not more than 100 miners employed at county mines are known to have been admitted to the union during the late membership campaign.

Wages Higher in Hazard Field

Most of the operators in the Hazard field of Kentucky, especially the larger ones, have increased the miners' pay by 20 per cent, according to a dispatch from Whitesville, Ky. The increase was not promised as permanent, but it was hoped that it would not be necessary to revise either way. The smaller companies, it is believed, will soon follow suit.

C. W. Henderson, president of the Southern Appalachian Coal Operators' Association, announced in Knoxville, Tenn., on Nov. 9 that 12,000 miners, employed in mines of association members in southeastern Kentucky, Tennessee and Virginia would be affected by a voluntary 25-per cent increase in wages. The advance in pay was based on the present temporary rise in the coal market; therefore wages will later be increased or decreased according to changes in market conditions.

A miners' strike of short duration at the Pacific Coal Co. mine at Morgan, near Central City, in western Kentucky, has been settled and the workers have agreed to return to work. The company discharged sixteen men who signed up with the United Mine Workers. A good many others who had joined figured that they also would be fired, and about 200 walked out. Later the company withdrew its order that men joining the union would be discharged, and the men agreed to return to work. W. D. Duncan, national committeeman for the United Mine Workers, which is without a president or secretary in western Kentucky, has been busy recently trying to reorganize the union, now that the miners are working steadily. He asserts that Ohio and Muhlenburg counties are fairly well organized by the union and that he is turning his attention to Webster County.

Over the Cumberland Mountain section the operators have generally advanced wages by 20 per cent or better.

It was reported a few days ago that officials of the United Mine Workers would make a strong effort to organize the southern Indiana field and that John L. Lewis, national president, would be brought into the field to help the movement along. William Stinson, of Oakland City, Ind., member of the executive board of District No. 11, who met with a group of union miners in Evansville last week to discuss the matter, said:

"All of the mines which are opening up are employing union labor and I can see no call for any special effort to bring more men into the union fold. Of course we are continuing to enlist as many of the non-union workers as possible but they are getting to be so few and far between that it seems to us to be unnecessary."

Representatives of the J. A. Paisley interests, of Cleveland, and the district officials of the United Mine Workers were in Washington last Thursday for a conference with Secretary of Labor Davis regarding a controversy over operation of Paisley mines in eastern Ohio and West Virginia. The dispute arose over a demand by the union that the company place its mines in West Virginia on a union basis before resuming operations at its eastern Ohio mines under a union agreement. The West Virginia mines were recently reopened on an open-shop basis.

Mingled Surprise and Skepticism Greets Report of Large Coal Stocks; Distribution More Uneven Than Usual

By Paul Wooton
Washington Correspondent of *Coal Age*

That coal to the extent of 44,000,000 tons was in storage on Oct. 1, as shown by the Bureau of Mines stock report, has been received in many quarters with surprise not unmixed with skepticism. An unusual number of inquiries as to how the figures are obtained has been received at the Bureau of Mines.

While the total arrived at in the stock report is an estimate, it nevertheless rests on substantial knowledge, it is pointed out by Bureau officials. The total is based on actual reports in writing signed by officers of some five thousand representative consumers.

All Lines Covered

These consumers are scattered throughout the country and are representative of all classes of business. Most of the large consumers are included, as are many of middle and small size. Although the Fuel Administration ascertained that there were 94,000 carload-lot buyers in the country, of whom 38,000 were retailers, the tonnage consumed by the firms on the Bureau of Mines list is a very large part of the total. The companies reporting include every steel plant, every byproduct coke plant, every railroad of size (these figures are furnished by the American Railroad Association), nearly every coal gas works, and 595 of the largest electric utilities. Besides the list includes more than 2,000 general industrial plants and 877 of the larger retail dealers.

The total stocks shown by these signed reports were 28,000,000 tons, or 64 per cent of the estimated total. Although the estimated total allows for some 88,000 plants not reporting, these plants are assigned only 35 per cent of the estimated total.

In allowing for these other plants the Bureau has two methods of estimating. One is the total amount held by those not covered by the survey on the basis of what has been ascertained in the past. Therefore their relation to the quantity of firms that do report is known. The other method, used as a check on the first, is to ascertain the number of days' supply held by consumers that do not report, assuming this to represent the condition of all consumers, to multiply the days' supply by the rate of consumption which has been observed from time to time in the past for industrial concerns. This rate is known accurately because of the periodical reports to the Bureau of the Census.

The Bureau is careful to point out in its report that the total stocks may be as low as 42,000,000 tons and as high as 46,000,000 tons, with probabilities pointing to 44,000,000 tons.

Specialists outside the government service have a ready explanation as to why such enormous stocks can exist at a time when the spot price has been high. The detailed figures on stocks by localities, which the Bureau offers to supply to anyone who requests them, show a wide variation by localities. Stocks never are evenly distributed. Some habitually carry large reserves, while others operate on a hand-to-mouth basis. It is clear that the distribution on Oct. 1 was more uneven than usual. For example, industrial plants as a whole had somewhat less coal than on Oct. 1 a year ago. There were entire states west of the Mississippi and south of the Ohio and Potomac which had much more coal in storage than a year ago. On the other hand, the groups consisting of New England and the Middle Atlantic states had much less coal than a year ago.

It also is clear from reports coming in from the outside that there is more variation than usual between stocks of individuals. Some wise virgins remember the consequences of the war and of the situation in 1921-22 and carry heavy reserves, but the behavior of the market is governed more by the action of the foolish virgins who did not learn the lesson and have allowed stocks to drop below the point of safety.

Finally, it was evident that the market was built to no small extent on psychology. It has been demonstrated again and again that fear of a shortage is just as effective in producing demand as an actual shortage. It is apparent that when the price started up many bought additional coal for storage because they feared the price might go higher.

EDITOR'S NOTE—*The foregoing Washington letter reflects certain views of official Washington. Due to the fact that policy as a rule prevents government officials from permitting their views being quoted directly, the authority for these reports is necessarily somewhat vaguely referred to. The views reflected are not those of any one group of officials, but of different men, in the legislative and executive departments. There is no necessary connection between their views and* COAL AGE *editorial policy; neither do they necessarily represent Mr Wooton's personal views. It is felt that the opinions thus faithfully reflected will be of great interest to the industry. Where opinions are cited from sources outside of the government, the source will be specifically stated.*

Rolling Stock Ordered

Orders for coal equipment recently placed include the following: Harwick Coal & Coke Co., Pittsburgh, Pa., 325 mine cars, with the Hockensmith Wheel & Mine Car Co. and 100 to the American Car & Foundry Co.; Buffalo, Rochester & Pittsburgh Ry., 500 steel hopper cars with the American Car & Foundry Co. in addition to a similar contract with the Pressed Steel Car Co.; E. E. White Coal Co., Glen White W. Va., 100 mine cars, with the Watt Steel Car & Wheel Co.; Crystal Coal & Coke Co., Bramwell, W. Va., 50 mine cars, with the Hockensmith company.

Coal Loadings Heaviest In Eight Years

Coal shipments this autumn have been the greatest for this season of any year except 1918, when the movement was stimulated by the world war, according to the Car Service Division of the American Railway Association. From Aug. 30 to Oct. 23 this year, 1,960,381 cars have been loaded with both bituminous and anthracite. This exceeded by 363,687 cars the total for the corresponding period last year and was only 39,250 cars less than in the corresponding period in 1918.

The railroads are handling this heavy movement of fuel with few transportation difficulties, the local car shortages reported in certain isolated cases having been of short duration.

Tidewater Permit System On C. & O. Approved

The permit system inaugurated by the Chesapeake & Ohio Ry. in handling of shipments of coal to tidewater has been given temporary approval by a committee of operators of southern West Virginia until it can be tested, as the result of a conference held Nov. 9 in Huntington, W. Va., between operators, representatives of the Chesapeake & Ohio Ry., the American Railway Association and the Interstate Commerce Commission. The conference was held after some operators in eastern Kentucky and southern West Virginia had complained that the permit system was responsible for depressing prices and had placed control of the market in the hands of buyers. After an all-day session, the following resolution was adopted:

"Inasmuch as the Chesapeake & Ohio Railway Co. has modified their embargo 176-25, effective Nov. 5, and that the elapsed time since that date has not been sufficient to determine the final effect of the embargo, it is moved that it be the sense of this meeting that their present plan remain in effect and that the coal operators in attendance at this meeting report back to their associations the result of the meeting, with the idea that if after trial, objections arise, the right is reserved to present such objections to the officials of the Chesapeake & Ohio Ry."

The resolutions were agreed upon at an executive session of a general committee composed of three operators from four major coal-producing districts and were presented to the conference by H. A. McCallister, of the Logan field.

The permit system was defended by A. T. Lowmaster, general superintendent of transportation of the C. & O., who declared that it was the only feasible way in which tidewater shipments could be regulated. He declared that notwithstanding a partial embargo enforced on July 16, but later modified, pier facilities at Newport News have been congested ever since.

Northwestern Traffic Bureau Accused of Unfair Methods

Unfair business practices are cited as the basis of a cease and desist order issued Nov. 13 by the Federal Trade Commission against the Northwestern Traffic and Service Bureau, Minneapolis, Minn.

The bureau was charged with being a combination of approximately 1,800 coal dealers doing business in Iowa, Minnesota, North Dakota, South Dakota, Nebraska, Kansas and Missouri, in conspiracy to restrain the trade of competitors.

The complaint set forth that the bureau carried on propaganda for its membership and circulated derogatory statements concerning dealers who sold direct to consumers and operated independently of the bureau. It was also alleged that the bureau used its influence to prevent wholesale dealers from selling and delivering coal to independent dealers.

Cost and Value of Ohio Coal To Be Basis of Inquiry

"The basis for solving the Ohio mine depression is cost and value of coal and not sentiment," said Samuel S. Wyer, chairman of the coal mining committee of the Ohio Chamber of Commerce, recently named to make an exhaustive study of the Ohio coal mining situation with a view of reviving it. In a recent statement on the matters to be taken up by the committee he summarized the problems to be settled as follows:

"While Ohio's coal production is scattered throughout twenty-seven counties, 90 per cent is concentrated in eight counties. Although Ohioans are much more interested in the investment in Ohio coal properties and with what employment may be found for idle Ohio miners, we should picture the coal production of the state in its relation to national production. Ohio is now producing less than 5 per cent of the nation's coal production. No national interests, therefore, are involved as to whether Ohio miners work or whether they do not work. The nation can get along without Ohio coal.

"Ohio's mining problem is, therefore, a sociological one. The question arises as to what is to be done with the large number of unemployed men in the Ohio coal industry. A part of the task will be to help the miners find themselves, economically speaking, and assist them in making the necessary adjustments in getting into other lines of work where there is need for their service.

"The nature of Ohio's coal must be reckoned with in any plan for a revival of the industry. It is good for specific purposes but not so good for others. Much Ohio coal is worth less and takes more for a given service than some of its competitors. As an offset to the quality situation, Ohio coal is closer to its markets than its competitors, and therefore should have this advantage in freight cost.

"Coal is sold on the basis of cost and value and not on the basis of sentiment, state pride, or emotional appeal. Both the operator and the miner must square off to this fundamental fact if a working relationship is to be developed that will permit the operation of Ohio mines in competition with the mines of contiguous states."

Fuel Research Activities On National Scale

In order to increase interest in fuel research and to bring about a much needed co-ordination of the various activities in this field, especially those undertaken by the various technical and industrial organizations, a movement recently was started by the Fuel Research Committee of the American Society of Mechanical Engineers, of which F. R. Wadleigh is chairman, to bring about the organization of a National Fuel Research Board. It is expected that all of the leading technical societies, together with the U. S. Bureau of Mines and Bureau of Standards and the national trade and commercial bodies, will be represented on the Board. Especially is it hoped that the National and other coal associations will aid in this movement, which, it is believed, can be made of great benefit not only to the coal industry itself but to every consumer as well.

The great value of active, coordinated fuel research is fully recognized in foreign countries, perhaps to a greater extent than in the United States. Evidence to this effect is found in the 1926 report of the British Royal Coal Commission, a whole chapter of which is devoted to fuel research. The following quotation is taken from the report: "The problems connected with the utilization of coal concern not only the coal industry but every industry, perhaps every individual in the country."

Approval has been given this plan by the American Institute of Mining and Metallurgical Engineers.

Mine Blast Kills Three

An explosion in the morning of Nov. 15 in the Alexander mine of the Glendale Gas Coal Co., Moundsville, W. Va., caused the death of two men and a boy. Two others were seriously injured and two were entombed. Eleven others escaped. The blast occurred in the south entry about a quarter mile from the shaft. The mine, which is operated by the J. A. Paisley interests, of Cleveland, has a normal working force of over 200, but the explosion occurred before the regular force reported for work. The cause of the explosion had not been ascertained when this issue was going to press, but it was believed that afterdamp was responsible for the three deaths. The entombed miners were still alive, however, and there was hope that they would be rescued.

Conviction for Violation of Priority Order Affirmed

In an opinion handed down Nov. 9 the U. S. Circuit Court of Appeals at Cincinnati affirmed the conviction of Edward P. Avent, Jr., on a charge of violating a priority order of the Interstate Commerce Commission during the coal strike of 1922. Avent appealed from a fine of $2,000 assessed by Federal Judge Peck. According to the indictment, returned February 5, 1923, Avent was charged with having fraudulently induced railroads to transport coal for the alleged purpose of making gas, but with the actual intention of making Portland cement. Avent, as a member of the firm of Bewley-Darst Coal Company of Cincinnati shipped the coal from Kentucky to Michigan and was tried on one of ten indictments brought against him in 1923.

Traffic News

Protest Exclusion of St. Paul From Chicago Through Rate

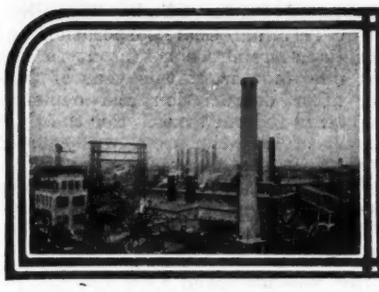
Complaint has been filed by the New River Coal Operators' Association against the Chesapeake & Ohio Ry., alleging that that line has failed and refused to include the Chicago, Milwaukee & St. Paul Ry. as a participating carrier in the joint through routes and rates from its line to Chicago, and that such failure is in violation of Sections 1 and 15 of the Interstate Commerce Act. It is claimed that some mines on the C. & O. and on the Virginian now enjoy rates in conection with the St. Paul road under certain routing conditions, while others are refused this privilege except at an added cost of $1.33 per ton. The prayer is for rates not to exceed those now in effect from Virginian Ry. Group 3 and the Norfolk & Western Ry. Group 3, which is $3.29 per ton.

Attack B. & O. Rates to Oswego

Complaint has been filed by the Oswego (N. Y.) Chamber of Commerce against the Baltimore & Ohio R.R. et al., attacking the rates on bituminous coal from the Clearfield, Greensburg, Westmoreland, Reynoldsville, Pittsburgh, Connellsville, Meyersdale, Cumberland, Fairmont and other groups in the states of Pennsylvania and West Virginia to Oswego and surrounding territory. It is claimed that the rates to this section are unreasonable and in violation of Section 1 of the act.

Atlanta Rate Inquiry Deferred

The Interstate Commerce Commission has announced that hearing that was set in I. & S. Docket 2787 for Nov. 15 has been postponed until Dec. 6 at Washington. The question involves tariffs of the Louisville & Nashville and the Nashville, Chattanooga & St. Louis railroads, reducing the rates on coal from eastern Kentucky and Tennesee to Atlanta, Ga., and intermediate points 15c. per ton.



News Items From Field and Trade

ILLINOIS

Miller Reopens Nason Mine.—The Nason mine, at Nason, in Jefferson County, has been reopened by Rice Miller, of Hillsboro, receiver. Two years ago it was heralded as the coming largest mine in the world. It has a twin tipple designed for a daily capacity of 10,000 tons and is owned by the Illinois Coal Corporation, of which Albert J. Nason is president. The corporation failed a year ago. Equipment in the mine at present is not sufficient for the maximum tonnage. It is expected to produce between 3,000 and 4,000 tons a day. Reopening was brought about by the higher prices obtainable for coal generally in the market.

Miners Return from Non-Union Fields.—Labor is scarce in Illinois. Operators are offering inducements to miners who left the fields last summer in order to bring them back. Hundreds of men who went into the western Kentucky non-union field are returning. Producers operating non-union mines in western Kentucky and southern Indiana are having a difficult time in satisfying the miners.

The Illinois Central R.R. has just taken delivery of fifty new heavy-duty Mikado type locomotives, thirty of which have been assigned to service in the Duquoin-Centralia district. The engines can easily pull 120- to 130-car trains of coal and were purchased especially for the heavy coal trains which leave the district daily for the Chicago, St. Louis and northern industrial centers. The engines were built by the Lima Locomotive Works.

Belleville Perks Up.—Approximately 1,000 miners have returned to work in the Belleville district within the past ten days according to James Mason, secretary of the Belleville sub-district. Mine No. 2 of the Kolb Coal Co., at Mascoutah, resumed Nov. 5 with 200 men. Golden Rule Mine, at Lenzburg, is again working with 150 men. The Ridge Prairie mine of the Prairie Coal Co., which was closed for three years, is working 50 men. Several smaller mines also have resumed work.

The Republic Coal & Coke Co., with headquarters in Chicago, has contracted for handling the output of the Silver Creek Colliery Co. mine at Farmington and the Kickapoo Coal & Mining Co., also at Farmington. This latter mine was only recently purchased by the newly organized Kickapoo company from the Alden people and has an output of approximately 1,200 tons daily.

September Output 5,260,369 Tons.—One hundred and seventy-five mines in Illinois produced 5,260,369 tons of coal during September, according to a report of A. D. Lewis, director of the State Department of Mines and Minerals. Miners averaged sixteen days for the month. Out of a total of 55,999 employed throughout the state, twelve were killed and 1,772 were injured. In the last seven months the mines of the state produced 32,317,810 tons of coal. Strip mines produced 301,570 tons during September.

Combustion Lectures for Salesmen.—A. A. Hooper, Harry Holverscheid and O. M. Fox have been selected as a committee by the Chicago Coal Merchants' Association to complete details for a lecture course on combustion open to members of the association to be held at the Hays Institute in Chicago. Lectures will be held once a week for eight weeks, beginning Friday, Jan. 7. The object sought is to increase the efficiency of retailers and coal salesmen on combustion questions.

Zeigler Mines Hit "High."—Two of the Zeigler mines recently broke their own records, when 16,142 tons was hoisted and dumped into railroad cars in one day. The capacity of these two mines was previously stated to be 15,000 tons. On Oct. 28, 8,513 tons was hoisted from No. 1 mine at Zeigler.

INDIANA

Eagle Mine Active.—The Eagle mine, in western Indiana, operated by the Eagle Coal & Mining Co., has reopened. The mine had been idle since last March, with the exception of about four days each month. It is in the Clinton field. It is said that several other mines in District 11 are planning to open.

Crown Hill Mine No. 6, West Clinton, idle since February, 1926, is being prepared for operation. This mine employs one hundred men. It is located on the Milwaukee tracks. A short strike at the Talleydale and Bardyke mines, also on the Milwaukee near West Clinton, has been terminated and the miners have returned to work.

The incorporation of the new Indiana Consumers Gas & By-Products Co., at Terre Haute, has been completed and the personnel of officers selected, with only one change from the list of officers formerly serving the Indiana Coke & Gas Co., which sold its interests to the newly formed company. Alfred M. Ogle, of Terre Haute, is chairman of the board of directors; Warren S. Blauvelt is president; Samuel D. Royse, vice president; M. E. Bradley, secretary, and Leon Stern, treasurer and sales manager. Mr. Royse is the new member of the board. The old organization was urged to remain in office, it is understood, because it was due to their efforts that the present development of policy and the products was of sufficient magnitude to attract the purchasers.

Pick-Up Spreads to Indiana.—Immediate opening of three large mines near Terre Haute indicates a return of prosperity in that field. The mines are owned by the Miami Coal Co. Two of the operations are in the Clinton field, one of which has been shut down for three years. Eighteen mines in the Clinton field now are in operation. This will make six mines that have resumed operations within a week in that territory.

KENTUCKY

Pacific Mine Running.—The Pacific Coal Co. mine at Morgan has resumed operations, with a full shift at work. C. D. Glass, owner of the mine, said all of the miners who refused to return to work last week, when several miners were discharged because of union affiliation, have reported for work. He stated the order that any man who joined the union would be discharged, was rescinded and that the men could join the union if they desired. However, he added, the mine would be run on an "open-shop" basis. No further trouble is expected, Mr. Glass stated.

Elk Horn Coal Corporation, Inc., reports, for the nine months ended Sept. 30, 1926, net income of $467,115, after all charges and federal taxes, comparing with $161,889 in the same period of the previous year. Net income for the September quarter was $218,417 after the above charges, against $187,045 in the preceding quarter.

The Bermuda Coal Co., of Chavies, has increased its capital stock from $125,000 to $225,000.

Turner Begins Sentence.—William H. Turner, former mine superintendent of the Aburn Mines, McCarr, convicted and sentenced to life imprisonment in connection with blowing up of two miners in 1925, in an insurance plot, was taken from Pikeville to Frankfort to start his sentence on Nov. 7. After the explosion Turner disappeared, and the $90,000 insurance on his life was collected by his relatives, while Turner was in Europe. Later it appears that his family failed to split with him, and he exposed the plot.

MISSOURI

Stripping Operation Under Way.—The Howard County Mining Co. has started preliminary work on a stripping operation near Higbee after months of legal difficulties. Following the erection of a tipple, a crusher of 1,600 tons capacity will be installed and the coal prepared for use by the Kansas City Light & Power Co., which has the contract for the entire output. At the present time the company has coal land totaling 400 acres, but it has options on much other land. The stripping will be done by a large steam shovel, which will be on the ground soon. Production at the new mine will begin by Jan. 10.

NEW YORK

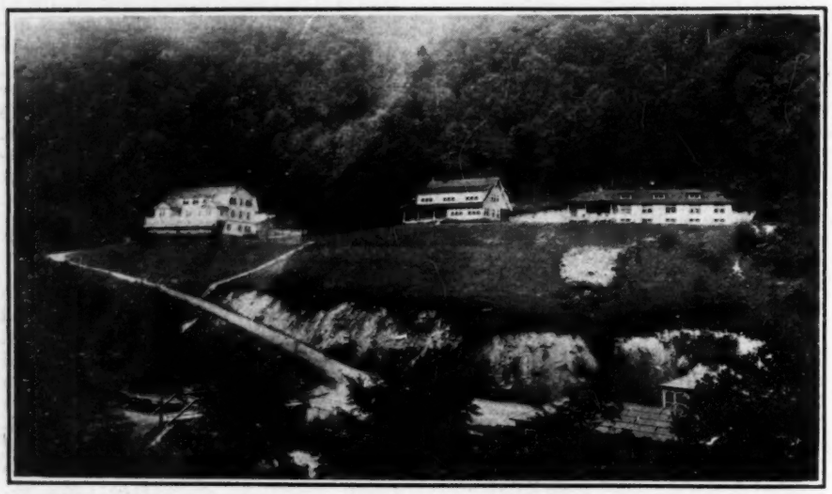
Inquisitor Defeated.—Deputy Attorney General Israel M. Lerner, who set in motion the investigation of the coal situation in New York City, was defeated in his campaign for election as judge of the City Court in Brooklyn. During the hearing at the County Court House in Manhattan a few weeks ago Samuel Untermyer, counsel for Burns Bros., accused Mr. Lerner of instigating the inquiry for campaign purposes.

The Janney Coal Mining Co., Inc., of 1 Broadway, New York City, has moved to larger offices on the seventh floor of the same building. Robert R. Schote is the general manager and G. Mason Janney is the president of this concern.

Burns Profits Decline.—Burns Bros. and subsidiaries for six months ended Sept. 30, 1926, show net profit of $635,140 after depreciation, federal taxes, etc., equivalent after 7 per cent dividend requirements on prior preference and preferred stocks to $4.67 a share earned on 97,365 shares of class A common and 67c. a share on 97,367 shares of class B stock. This compares with $867,271, or $6.63 a share on 80,944 shares of class A and $2.63 a share on 80,940 shares of class B stock outstanding in the six months ended Sept. 30, 1925. For the September quarter, net profit was $70,283 after the above charges, equivalent after preferred dividends, to 12c. a share on 97,365 shares of class A stock. This compares with net profit of $564,846, or $3.60 a share on class A and $1.60 a share on class B in the preceding quarter.

OHIO

Two Rail & River Mines Start.—Mines Nos. 4 and 6 of the Rail & River Coal Co., at Stewart and McClainesville, respectively, in Belmont County, have started operations after a long idleness. Mines No. 1 and 3, located at South Bellaire and Big Run, may be started later on. All of the mines of the Rail & River Coal Co. have been idle since April, 1925. When operating at capacity they give employment to about 1,000 men and produce 10,000 tons daily.



A Beauty Spot at Wolfpit, Ky.

It is the property of The McKinney Steel Co. At the left is the club house, in the center the residence of the general superintendent, and at the right the ladies' club. Several rooms "with bath" are a feature of the club house, which is a model for its size.

PENNSYLVANIA

May Repeal Hard-Coal Tax. — Another attempt will be made at the next session to have the Legislature repeal the anthracite tax. It is said that much missionary work has already been done among candidates in the recent election, many of whom are said to be responsive to the move to rescind the law.

Miner Killed in Riot of 300.—One man was killed in a riot Nov. 10 following a meeting of 300 mine workers in Mayfield Borough, near Scranton. Employees of the Pennsylvania Coal Co. had arranged the meeting to determine whether Joseph Dzwoncsyk, president of the miners' local, was looking after their interests properly. David W. Davis, international organizer of the United Mine Workers, and John Boylan had delivered speeches and the miners had voted confidence in the local president when the riot broke out. The outbreak is believed to have been started by four men known to the police, who have made three arrests.

Terminal Profits Climb.—The Pittsburgh Terminal Coal Corporation and subsidiaries report a net profit for the first nine months of this year of $81,345, after depreciation and depletion but before federal taxes. For the third quarter of 1926 the profit was $33,472, after the same charges, as contrasted with a loss of $66,791 in the preceding quarter and compared with a profit of $173,177 in the September quarter of last year.

The Westmoreland Coal Co. has removed its Philadelphia offices to the Lewis Building, N. E. Cor. Fifteenth and Locust Streets.

The Reading Co. lines moved 1,643,794 gross tons of bituminous coal during September, last, compared with 1,748,985 tons in the corresponding month a year ago.

Pittsburgh Output Climbs.—Production of coal at the open-shop mines of the Pittsburgh Coal Co. in the Pittsburgh district was 85,597 tons for the week ending Nov. 6, an increase of 11,768 tons over the preceding week. The average number of men at work in these mines was 3,578 per day, compared with 3,146 men during the last week of October. In addition to the 12 mines in operation on the non-union basis for the past year, men were employed during the week at Montour No. 4, Arnold No. 2 and Gallatin, preparing these mines for production of coal. Coal was dumped at Montour No. 4 on Nov. 6 and it was expected that the other mines would be ready to produce coal last week.

Receivership Hearing Held.—On Nov. 8 the Huntingdon County Court heard evidence on the application for a receiver for the Huntingdon & Broad Top Mountain Coal Co., which operates the Huntingdon & Broad Top R.R. through the Broad Top coal field. Owing to the condition of the market up until recently the company has been hard hit and has paid no dividends for years and has defaulted in interest payments for some time. A further hearing and arguments will be heard by the court on Dec. 20.

Stineman Receiver Named.—Alleging that the Harvey C. Stineman Coal Co. mines at South Fork, Cambria County, could be operated at a profit due to the favorable condition of the market, creditors on Nov. 5 asked the Cambria County Court to appoint a receiver for the firm. N. E. McCrossin, of South Fork, was named and his bond fixed at $20,000. The mine has been closed since early in the summer.

The Somerset Retail Coal Association was organized on Nov. 5 by local coal operators. The association was formed for the purpose of having coal sold at uniform prices and on a cash basis. These officers were elected: President, C. L. Davis; vice-president, Charles Darr; secretary, Newlin Lowry; treasurer, Ira A. Barron.

To Reopen Three Bell Mines. — Receivers of the Carnegie Coal Co., whose mines have been closed since the John A. Bell failure, have been granted court permission to spend $30,500 to open three mines, Cedar Grove, Armide and Atlas. These are union operations.

WEST VIRGINIA

To Extend Sewell Valley Line.—In view of the fact that the Sewell Valley R.R. is to become a part of the Chesapeake & Ohio system, subject to approval by the Interstate Commerce Commission, the parent road has announced plans to extend the Sewell Valley for a distance of 12 miles up Clear Creek as part of the road's extensive program in the Fayette-Nicholas-Greenbrier county area, where timber and mineral resources are to be developed. The estimated cost of the Clear Creek branch line has been placed at $600,000.

Classes in mining extension work at Gary, Welch and Coalwood are now studying mine fires and explosions while the classes at Kimball and Bartley are making a study of mine gases. The Kimball class, with a 96 per cent attendance, has carried off first honors for the first part of the term.

Mining Town Being Moved.—The Lillybrook Coal Co. is moving an entire town from a location near Pemberton, in Raleigh County, to a new site near Sullivan. The houses, containing from four to eight rooms, are being moved to the railroad, where they are loaded on flat cars and transported by rail the greater part of the distance before being returned to the blocks of the house mover.

Union Activities Enjoined. — An injunction restraining E. Kirk and 10 others as individuals, members, agents and officials of the United Mine Workers from interfering with the 500 employees of the Delmar Coal Co., operating at Rosemont, in Taylor County, was granted last week by Judge Warren B. Kittle, of Philippi. The coal company stated that if the union succeeded in organizing its men it would greatly curtail operations.

Fort Pitt Property Sold.—The Fort Pitt coal mining property, east of Wilsonburg in Harrison County, consisting of mining equipment and a number of acres of coal land, has been sold to J. H. Callaghan and others. Mr. Callaghan was at one time vice-president and manager of the Mt. Clare Collieries Co. Active operations will be resumed at once with about 50 men employed.

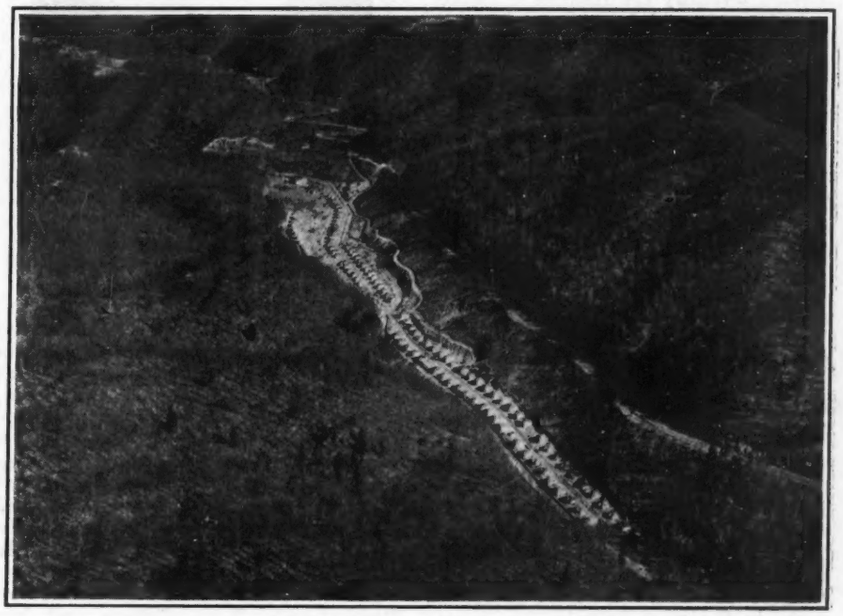
Merger Reported Under Way.—A merger of coal-mine properties in southern West Virginia is being negotiated, which will unite properties valued at approximately $5,000,000. It has not yet been definitely decided just what properties will be included in the consolidation. The companies figuring in the merger are controlled by W. H. Cunningham, Frank Enslow and G. D. Miller, of Huntington, W. Va. John Nickerson & Co. will head a syndicate of bankers that plans to offer an issue of $1,500,000 of bonds in connection with the merger.

Beury Property Sold.—The Southern Smokeless Coal Co., recently organized, having purchased the plants and property of the Beury Coal & Coke Co. at Beury, the purchasing company will immediately resume the production of coal there. The Southern company is capitalized at $50,000. Its incorporators are W. D. Guyer, of Charleston; George R. Bullock, of Thurmond; W. E. James, S. A. Moore and Dewitt Gallaher, of Charleston. The principal office of the company is to be at Beury, which is in the Fayette County field.

Tug River May Set New Record.—The secretary of the Tug River Coal Operators' Association has just announced that coal production in the Tug River field during the week ending Oct. 30 was the highest in the history of that field, totaling 172,347 tons. The next highest production week was in last February, when approximately 164,000 tons was mined. Total output for this year up to and including the week of Oct. 30 was 6,512,726 tons, indicating that the Tug River field is likely to break all production records this year unless something unforeseen happens. Production already is a million and a half tons ahead of the total at this time last year.

Alberta Insists on Rock-Dusting.—Regulations to make compulsory the rock-dusting of bituminous coal mines in the Province of Alberta, Canada, have been adopted and will be in force soon, according to George S. Rice, chief mining engineer of the U. S. Mines Bureau, who recently returned from Alberta. Mr. Rice was invited by Premier Brownlee to assist in an investigation of an explosion in the Crow's Nest district which killed two men, and following this investigation the U. S. Government official sat in on a conference attended by officials of the Canadian Government and bituminous and lignite producers. Mr. Rice reports that the bituminous producers agreed to the proposed rock-dusting regulations.

Besco October Output Heavy.—The British Empire Steel Corporation's total coal production in October was 597,616 tons, the best month's work for ten years. For the ten months ending Oct. 31 these mines produced a total of 4,285,233 tons, the tonnage by districts being: Dominion Coal Co. (Glace Bay and Waterford), 3,065,595; Sydney Mines, 430,964; Acadia (Pictou County), 385,960; Springhill (Cumberland County), 398,719.



Faraday, a Village of the Pocahontas Fuel Co., as Seen From an Aeroplane

The country looks less mountainous than it really is. The narrowness of the village—for the most part it has but one street—testifies to the steepness of the sides of the valley. The new mine that this village serves has been brought to a production of over 2,500 tons per day.

CANADA

August Output Above Average.—Production of coal from Canadian mines in August totaled 1,336,414 tons as compared with 1,394,155 tons in July. There was an increase of 17 per cent over the average for August during the preceding five years. Imports of coal from the United States during August were 1,616,101 tons, or 15 per cent below the previous month and compared with a five years' average for the month of 1,764,725 tons. Exports of Canadian coal during August were 98,512 tons, an increase of 65 per cent over July, but a decrease of 29 per cent from the five-year average for the month. Men employed in the mines during August totaled 25,479, as compared with 24,380 in July.

Tar Sand for Briquet Binder.—Tar sands from the McMurray district, Alberta, have been proved to be a serviceable binder in the manufacture of coal briquets. The University of Alberta some time ago conducted a series of experiments along this line and discovered that tar sand was the best material for this purpose. Coal slack from the Crow's Nest district was used along with some from the Edmunton field. In all cases the Athabasca binder worked satisfactorily, giving a clean and easy burning briquet.

Among the Coal Men

C. E. Tuttle has resigned as president of the Pittsburgh Terminal Coal Corporation and as vice-president of the North American Coal Corporation, according to a report current in the New York financial district late last week. He expects to devote his time, it is said, to the Tuttle Corporation.

Robert J. Montgomery, of Philadelphia, vice-president and general manager of sales of the Philadelphia & Reading Coal & Iron Co., recently embarked on a trip to Europe. He expects to return in about a month.

George G. Wolkins, sales manager in Boston territory for Hanson & Parker, recently returned from a seven weeks' tour abroad, which included Germany, Belgium and England.

Ray N. Hudson, chief of the Division of Simplified Practice of the Department of Commerce, has accepted an invitation to address the members of the Monongahela Operators' Association, Morgantown, W. Va., at a meeting of the association to be held in the near future.

F. F. Dixon, of Huntington, W. Va., who is well known in the Kanawha and New River coal fields, has been appointed general superintendent in charge of operations by the Crichton interests, which control the Meadow Creek Coal Co. & Greenbrier Smokeless Coal Co. in West Virginia.

Charles Kirk, Sr., formerly of Sullivan, Ind., has been appointed superintendent of the Gladstone coal mines near Petersburg, Ind. He succeeds Thomas Howard, who recently resigned. Mr. Kirk is being assisted by his son, Charles, Jr., who will take a prominent place in the work and development of the company's business.

Alexander E. Morrow has been appointed superintendent of the Bradford Mine of the Alabama By-Products Corporation, at Dixiana, Ala., succeeding Mr. Toller.

Fred Roof, who has been identified with the coal-mining industry in southern Colorado and is a banker of wide repute, has been made a director of the Rocky Mountain Fuel Co., which is one of the largest coal companies in Colorado. **H. F. Nash,** formerly vice-president and sales manager for the Alamo Coal Co., Oakdale Coal Co. and Barbour Coal Co., has been appointed sales manager for the Rocky Mountain Fuel Co. in place of W. B. McDonald, who has resigned.

Harry B. Scott, banker, coal operator and a member of the board of directors of the Central Pennsylvania Coal Producers' Association, was elected to the Pennsylvania State Senate on Nov. 2 from the Clearfield-Centre district. Mr. Scott is a resident of Philipsburg. Mr. Scott had previously served in the lower house. He is a Republican and served as a fuel administrator during the World war.

Chester B. Koontz, a member of the Norfolk staff of the W. H. Brown Coal Co. and representative of the Willard-Sutherland Coal Co., has joined the staff of the Flat Top Fuel Co. at Norfolk. He will continue as representative of Willard-Sutherland.

E. J. Gealy

E. J. Gealy, who during the last two years has been an engineering consultant and marketing counselor for several of the McGraw-Hill engineering papers, has returned to the staff of *Coal Age* as assistant editor. Mr. Gealy is a graduate of Pennsylvania State College and for several years was an electrical engineer with the Lehigh Valley Coal Co., one of the largest and most fully electrified anthracite companies. He also has served as director of engineering extension service conducted by Pennsylvania State College and has made several noteworthy contributions to the modernization of mining, both in practice and as author of a number of articles on haulage, automatic pumping, hoisting and electrical and mechanical features connected with many of the latest practices in mining and technical operations.

Obituary

Edward O. Dana Dead at 65

Col. Edward O. Dana, 65, widely known mine operator, died Nov. 9th at Christ Hospital, Cincinnati, Ohio, following an operation. He had been lil about two weeks.

Born in New York, Mr. Dana with his parents went to Cincinnati when he was a boy. He received his education in the Cincinnati schools and when he had attained his majority he joined his father, the late S. F. Dana, who in 1865 had founded the Campbell's Creek Coal Co.

Except during his service in the army during the Spanish-American War, he was active in the business of the firm founded by his father. During his service in the army he attained the rank of Colonel.

About ten years ago when the elder Dana died, Colonel Dana was promoted to the presidency of the coal company.

Most of the holdings of the firm are located in Kanawha County, West Virginia. He was an official of the Kanawha Coal Operators' Association, Charleston, W. Va., a member of the Great Kanawha River Improvement Association and president of the Campbell's Creek Railroad Co.

The Right Rev. Michael J. Hoban, Bishop of the Roman Catholic diocese of Scranton, Pa., for the last thirty years, died of pneumonia Nov. 13 at the age of 73. Bishop Hoban gained wide prominence because of his activities in behalf of the anthracite miners. He frequently was called upon by them for advice in the disputes with the operators, being credited with bringing about agreements several times, most of them favorable to the miners. The Bishop also was an active worker with citizens of the anthracite region to rid Scranton and other places of the mine-cave menace.

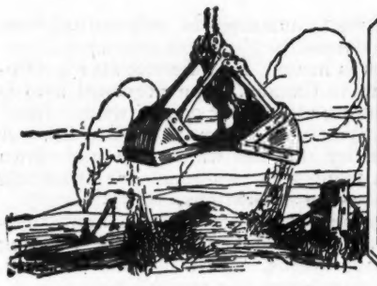
Thomas H. Wilson, aged 38, sales manager of the Red Jacket Consolidated Coal Co., with offices in Columbus, Ohio, died suddenly at his home there Nov. 10 following an illness of two days. His brother, H. T. Wilson, is president of the Red Jacket Company, a subsidiary of the W. M. Ritter Lumber Co., of Columbus. The company has extensive coal mines in West Virginia and is a large factor in that field. At the age of 10 years the decedent started working as a trapper at Glen Richey, Pa. Six years later he went to Logan, W. Va., where he became connected with the H. T. Wilson Coal Co., which interests were later merged with the Red Jacket.

George W. Cooper, aged 45, treasurer of the Tressler Coal Co., Flemington, W. Va., died Nov. 7 at his home, in Monongahela, Pa. Death was due to apoplexy following an illness of three weeks. He also was prominent in banking and Masonic circles.

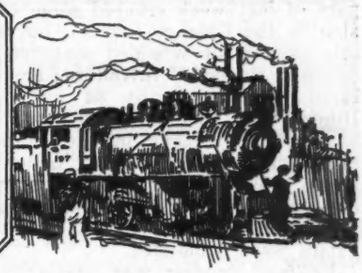
Association Activities

The annual election of the **Buffalo Bituminous Coal Association,** held Nov. 9, resulted in the choice of F. H. Hoag as president and George E. Hughes as secretary-treasurer. The board of directors, elected a few days previous, consists of the officers and Harry F. Coxon, Guernsey Camp and the retiring president, Fred A. Mohr.

Four large operations have been added to the membership of the **Operators' Association of the Williamson Field** (West Virginia) during the last few weeks, according to President Thomas DeVenny, who cites this membership growth as a reflection of the appreciation for services rendered the industry by his organization. Operators are especially enthusiastic about the past sales reports and the credit service. The new members of the Williamson association have an aggregate production of close to one and one-half million tons annually.



Production And the Market



U. S. Soft Coal Markets Fluctuate with Reports Of Impending End of British Strike

London, England, was the nerve center of the bituminous coal markets of the United States last week. Prices along the Atlantic seaboard and over a great part of the Appalachian Region fluctuated in sympathy with the color of the reports of the latest negotiations to end the British coal strike. There were dips and rises, but, when the week was over, price levels had definitely receded. The declines ranged from a modest 25c. in the central Pennsylvania mining field to $1.25 at tidewater.

One section of the Eastern producing area—Alabama—and Illinois and Indiana were impervious to this influence. In those sections the belated upturn to business was strong enough to carry prices to higher levels and to support an enlarged demand for tonnage. Western Kentucky was stronger in Louisville and weaker in Chicago. Southwestern and Far Western coals held a steady course. Neither Utah nor Colorado, however, found buying enthusiastic, and "no bills" were the lot of producers in both states. Activity characterized the dock trade.

General Decline in Prices

The result of the play of these forces and of other factors, including labor and transportation, was a net decline of 24 points and 29c. in *Coal Age* Index of spot bituminous prices. The index number as of Nov. 15 was 275 and the corresponding weighted average price was $3.32. The preceding week the figures were 299 and $3.61, respectively. The full effect of the breaks in the tidewater and Eastern interior markets were not felt because of the gains made in Illinois and Indiana quotations.

Although present trends are distinctly downward another upswing is by no means improbable—even if the British strike comes to a speedy end. Many large producers are sold up for several weeks; some, in fact, say they will be out of the market until the first of the year. In the meantime, home industrial and household demand is expanding and there are vacuums in foreign markets which cannot be filled overnight. When these demands are registered upon a transportation plant working to capacity another orgy of feverish bidding easily is possible.

Production Near Record Figures

New high record loadings the latter part of the week so far overcame the losses incurred the first two days of the month that output for the week ended Nov. 6 was estimated at 13,116,000 net tons. Figures covering loadings on Monday and Tuesday of last week were still larger, indicating the possibility of another week close to, if not exceeding, the top figure of 13,486,000 net tons in the last week of October.

Roughly speaking, 1,500,000 tons of the output of the first week of November were absorbed by tidewater export and lake trade. Export dumpings at the five principal ports (New York, Philadelphia, Hampton Roads, Baltimore and Charleston) were 709,154 net tons. Of this tonnage, at least 500,000 tons may be credited to the British strike. In the lake trade the season totals are well ahead of any recent year since 1923, but this movement is drawing to a tapering close. During the week ended Nov. 14 there were 645,011 tons of cargo and 35,022 tons of vessel fuel dumped at the lower lake ports.

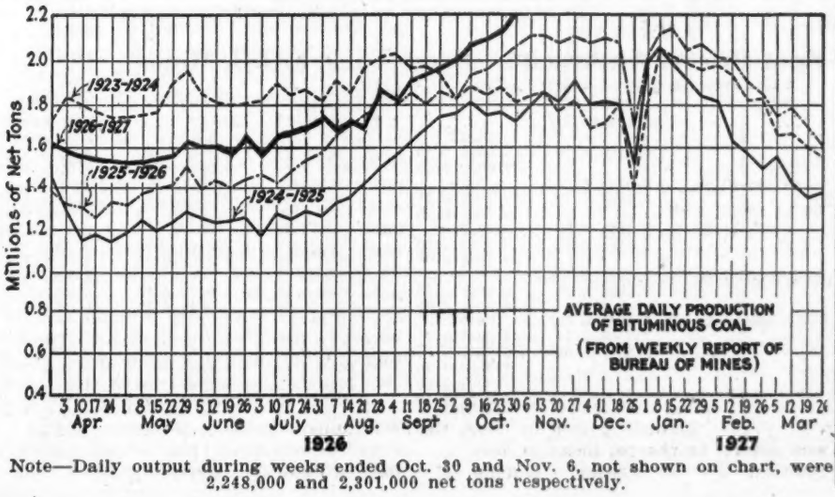
Anthracite Demand Uneven

Anthracite production is not keeping pace with the gains in bituminous. Holidays take a heavier toll of output. During the week ended Nov. 6 the quantity mined was estimated by the U. S. Bureau of Mines at 1,565,000 net tons, as compared with 2,062,000 tons the third week in October. However, the trade seems willing to absorb all offerings although egg is less popular than stove or nut and independent quotations on domestic sizes are weaker. No. 1 buckwheat has been adversely affected by the softer tone in bituminous.

The Connellsville coke trade is marking time. There have been some decreases in prices, but production is sharply restricted. With the exception of January of this year, byproduct production last month was the highest on record. The total was 3,812,000 net tons. A 34 per cent decline in beehive output brought the total output of coke down to 4,679,000 tons.

Middle West Keeps Pace

While Eastern markets were moving downward under the influence of the news from Great Britain, Illinois and Indiana held their gains in prepared sizes and increased prices on mine-run. Heavy buying by wholesalers the fore



Note—Daily output during weeks ended Oct. 30 and Nov. 6, not shown on chart, were 2,248,000 and 2,301,000 net tons respectively.

Estimates of Production

(Net Tons)

		1925	1926
BITUMINOUS			
Oct. 23		12,088,000	12,712,000
Oct. 30 (a)		12,485,000	13,486,000
Nov. 6 (b)		12,171,000	13,116,000
Daily average		2,135,000	2,301,000
Cal. yr. to date		429,423,000	474,014,000
Daily av. to date	(c)	1,637,000	1,807,000
ANTHRACITE			
Oct. 23		13,000	2,062,000
Oct. 30		19,000	1,805,000
Nov. 6		28,000	1,565,000
Cal. yr. to date	(c)	61,359,000	71,591,000
BEEHIVE COKE			
Oct. 30 (a)		261,000	196,000
Nov. 6 (b)		292,000	192,000
Cal. yr. to date	(c)	8,443,000	10,039,000

(a) Revised since last report. (b) Subject to revision. (c) Adjusted to equalize number of days in the two years.

part of last week created some confusion in the Chicago market, but after this excitement subsided southern Illinois and Fourth Vein Indiana domestic lump held firmly at $4 and other Illinois and Indiana 6-in. coal was $3.50@$3.75, except in the Standard field, which sold 90c. to $1 under this range. The differential for strip-pit coal narrowed to 25 to 50c. under shaft-mine prices and in some cases full circulars were demanded.

Railroad buying was primarily responsible for the strengthening of the prices on mine-run. Demand for prepared sizes and screenings also contributed, as it placed producers in a position where they could safely refuse orders on mine-run which were not attractive from a price standpoint. Southern Illinois mine-run now commands $2.75@$3. Central Illinois and Fourth Vein Indiana bring $2.50@$2.75. Standard lags behind at $2@$2.25 and western Kentucky brings $2@$2.50 in the Chicago market. For the time being there is little interest in Eastern coals because of the high spot prices.

Southern Illinois operations are averaging four days a week. Transportation deficiencies are blamed by the operators for failure to attain full-time production. There are practically no "no bills" in the field. Labor is none too plentiful although it is reported that workers from western Kentucky, which has been reluctant to follow the other non-union districts in increasing wages, are drifting into Illinois. This movement is expected to grow unless the Kentucky operators fall in line.

Mining Districts Feel Boom

The situation in the Duquoin and Jackson County fields is on all fours with that existing in Franklin, Saline and Williamson counties except that railroad tonnage is less a factor than in southern Illinois. More mines are being reopened. Mt. Olive appears to be working to the limit of car supply; railroad business is substantial and movement to Northern consuming centers is heavy. This district also is shipping to Canada. The Standard field is running about four days a week. Locomotive fuel orders are plentiful. A number of mines which have been down six months to two years are preparing to resume operations.

Conditions in the local St. Louis market are anomalous. Despite freezing temperatures, retail demand is easy. Buying favors the medium priced coals. Wagon steam trade is active. Movement of nut coal to Omaha and Kansas City is well maintained. Screenings are going north in volume and some steam coal is rolling to the Gulf ports for export. Effective Nov. 10, St. Louis retail prices were advanced to the following: Southern Illinois lump, $8.25; Mt. Olive, $7@$7.25; Duquoin, $6.50; Standard, $6; anthracite domestic, other than pea, $17@$17.75; pea, $14.75; gashouse coke, $10.75; byproduct coke, $11.25@11.75.

Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F.O.B. Mines

Low-Volatile, Eastern	Market Quoted	Nov. 16 1925	Nov. 1 1926	Nov. 8 1926	Nov. 15 1926†
Smokeless lump	Columbus	$6.25	$5.75	$5.50	**$5.25@$6.00**
Smokeless mine run	Columbus	3.10	4.25	4.25	4.00@ 4.50
Smokeless screenings	Columbus	2.60	2.75	2.75	2.50@ 3.00
Smokeless lump	Chicago	5.75	5.50	5.50	5.25@ 5.75
Smokeless mine run	Chicago	2.50	3.75	3.75	3.50@ 4.00
Smokeless lump	Cincinnati	5.50	5.60	5.50	5.00@ 6.00
Smokeless mine run	Cincinnati	2.50	3.50	3.75	**3.75@ 4.50**
Smokeless screenings	Cincinnati	2.00	3.00	3.25	3.00@ 3.50
*Smokeless mine run	Boston	5.00	9.75	10.00	*8.50@ 9.50*
Clearfield mine run	Boston	2.05	3.85	3.90	*2.75@ 3.50*
Cambria mine run	Boston	2.35	4.50	4.25	*3.25@ 3.75*
Somerset mine run	Boston	2.20	4.10	4.00	*3.00@ 3.50*
Pool 1 (Navy Standard)	New York	2.85	4.60	4.60	*4.00@ 4.25*
Pool 1 (Navy Standard)	Philadelphia	2.95	4.25	4.50	*4.25@ 4.50*
Pool 1 (Navy Standard)	Baltimore	2.15	4.10	4.60	*3.50@ 3.75*
Pool 9 (Super. Low Vol.)	New York	2.30	4.35	4.35	*3.50@ 4.00*
Pool 9 (Super. Low Vol.)	Philadelphia	2.30	4.20	4.45	*4.25@ 4.50*
Pool 9 (Super. Low Vol.)	Baltimore	1.95	3.85	4.25	*2.75@ 3.25*
Pool 10 (H.Gr.Low Vol.)	New York	2.00	4.00	4.00	*2.75@ 3.00*
Pool 10 (H.Gr.Low Vol.)	Philadelphia	2.05	4.10	4.35	*3.75@ 4.00*
Pool 10 (H.Gr.Low Vol.)	Baltimore	1.80	3.55	3.85	*2.50@ 2.75*
Pool 11 (Low Vol.)	New York	1.70	3.80	3.85	*2.50@ 3.00*
Pool 11 (Low Vol.)	Philadelphia	1.90	3.40	3.65	*3.50@ 3.75*
Pool 11 (Low Vol.)	Baltimore	1.55	3.15	3.60	*2.25@ 2.50*
High-Volatile, Eastern					
Pool 54-64 (Gas and St.)	New York	1.55	3.85	3.75	*2.25@ 3.00*
Pool 54-64 (Gas and St.)	Philadelphia	1.60	3.50	4.20	*3.25@ 3.50*
Pool 54-64 (Gas and St.)	Baltimore	1.55	3.50	3.75	*2.75@ 3.00*
Pittsburgh sc'd gas	Pittsburgh	2.85	4.75	4.35	*3.25@ 3.75*
Pittsburgh gas mine run	Pittsburgh	2.35	4.25	3.85	*3.00@ 3.25*
Pittsburgh mine run (St.)	Pittsburgh	2.15	4.00	3.50	*2.50@ 3.00*
Pittsburgh slack (Gas)	Pittsburgh	1.45	3.10	3.00	*2.00@ 2.40*
Kanawha lump	Columbus	3.10	4.25	5.25	*4.75@ 5.50*
Kanawha mine run	Columbus	1.70	3.75	4.00	*3.50@ 4.25*
Kanawha screenings	Columbus	1.20	2.10	2.10	2.00@ 2.25
W. Va. lump	Cincinnati	3.50	4.50	4.85	**5.00@ 5.50**
W. Va. gas mine run	Cincinnati	1.65	4.00	3.85	*3.00@ 3.50*
W. Va. steam mine run	Cincinnati	1.55	2.75	3.85	*3.00@ 3.50*
W. Va. screenings	Cincinnati	1.35	2.25	3.25	*3.00@ 3.25*
Hocking lump	Columbus	3.10	4.00	5.00	4.75@ 5.25
Hocking mine run	Columbus	1.65	3.25	3.10	*2.50@ 3.00*
Hocking screenings	Columbus	1.25	2.05	2.25	*2.00@ 2.25*
Pitts. No. 8 lump	Cleveland	2.55	3.75	4.00	*3.00@ 3.75*
Pitts. No. 8 mine run	Cleveland	1.95	2.95	3.10	*2.75@ 3.00*
Pitts. No. 8 screenings	Cleveland	1.40	2.60	2.45	*2.15@ 2.35*

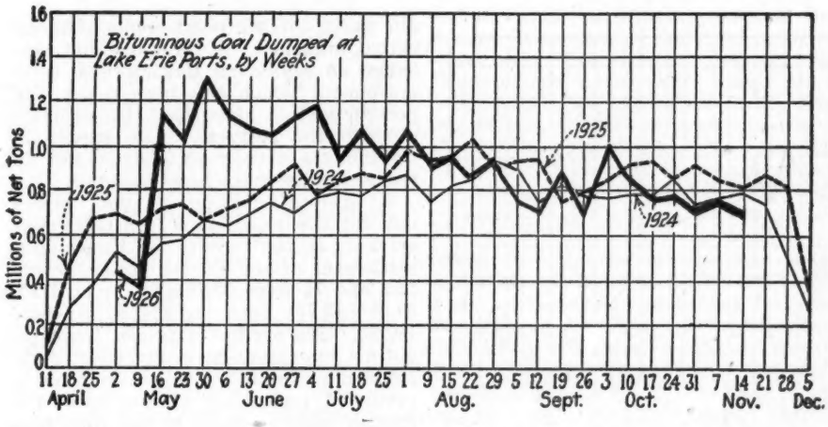
Midwest	Market Quoted	Nov. 16 1925	Nov. 1 1926	Nov. 8 1926	Nov. 15 1926†
Franklin, Ill. lump	Chicago	$3.50	$3.50	$4.00	**$4.00**
Franklin, Ill. mine run	Chicago	2.35	2.40	2.40	**2.75@ 3.00**
Franklin, Ill. screenings	Chicago	1.60	1.70	1.85	1.75@ 2.00
Central, Ill. lump	Chicago	3.00	2.85	3.50	3.25@ 3.75
Central, Ill. mine run	Chicago	2.70	2.20	2.20	**2.50@ 2.75**
Central, Ill. screenings	Chicago	1.40	1.45	1.70	1.60@ 1.85
Ind. 4th Vein lump	Chicago	3.10	3.25	4.00	**4.00**
Ind. 4th Vein mine run	Chicago	2.35	2.25	2.25	**2.50@ 2.75**
Ind. 4th Vein screenings	Chicago	1.80	1.60	1.85	1.75@ 2.00
Ind. 5th Vein lump	Chicago	2.35	2.65	3.50	3.25@ 3.75
Ind. 5th Vein mine run	Chicago	1.95	2.00	2.00	**2.25@ 2.50**
Ind. 5th Vein screenings	Chicago	1.40	1.35	1.60	1.50@ 1.75
Mt. Olive lump	St. Louis	2.85	2.60	2.85	**3.00@ 3.25**
Mt. Olive mine run	St. Louis	2.00	2.25	2.75	**2.75**
Mt. Olive screenings	St. Louis	1.75	1.25	1.50	**1.50@ 1.75**
Standard lump	St. Louis	2.40	2.35	2.60	**2.60@ 2.75**
Standard mine run	St. Louis	1.80	1.80	2.00	**2.00@ 2.25**
Standard screenings	St. Louis	.85	.85	1.15	**1.25@ 1.50**
West Ky. block	Louisville	2.10	2.65	3.75	**3.50@ 4.25**
West Ky. mine run	Louisville	1.35	1.40	2.00	1.75@ 2.25
West Ky. screenings	Louisville	.80	1.00	1.70	1.40@ 2.00
West Ky. block	Chicago	2.35	2.75	4.00	*3.50@ 3.75*
West Ky. mine run	Chicago	1.25	1.40	2.25	2.00@ 2.50
South and Southwest					
Big Seam lump	Birmingham	2.25	2.50	2.60	**3.00**
Big Seam mine run	Birmingham	1.65	1.85	2.10	2.00@ 2.25
Big Seam (washed)	Birmingham	1.85	2.05	2.35	2.25@ 2.50
S. E. Ky. block	Chicago	3.75	4.75	5.50	5.00@ 6.00
S. E. Ky. mine run	Chicago	2.15	3.10	3.25	3.00@ 3.50
S. E. Ky. block	Louisville	3.60	4.60	5.60	*5.00@ 5.75*
S. E. Ky. mine run	Louisville	1.60	3.75	4.25	*3.75@ 4.50*
S. E. Ky. screenings	Louisville	1.35	2.50	3.25	**3.25@ 3.75**
S. E. Ky. block	Cincinnati	3.75	4.50	4.85	**4.75@ 5.50**
S. E. Ky. mine run	Cincinnati	1.60	3.60	3.75	*3.00@ 3.50*
S. E. Ky. screenings	Cincinnati	1.25	2.10	3.25	*2.75@ 3.25*
Kansas lump	Kansas City	5.00	4.60	4.60	4.50@ 4.75
Kansas mine run	Kansas City	3.10	3.00	3.00	3.00
Kansas screenings	Kansas City	2.30	2.35	2.35	2.35

* Gross tons, f.o.b. vessel, Hampton Roads
† Advances over previous week shown in **heavy type**, declines in *italics*

Current Quotations—Spot Prices, Anthracite—Gross Tons, F.O.B. Mines

	Market Quoted	Freight Rates	Nov. 16, 1925 Independent	Nov. 16, 1925 Company	Nov. 8, 1926 Independent	Nov. 8, 1926 Company	Nov. 15, 1926† Independent	Nov. 15, 1926† Company
Broken	New York	$2.34	.....	$8.20@$8.95	.....	$8.50@$9.25	.....	$8.50@$9.25
Broken	Philadelphia	2.39	‡	‡	$9.25	8.50@ 9.15	$9.25	8.50@ 9.15
Egg	New York	2.34	‡	8.65@ 8.90	9.00@ 9.50	8.75@ 9.25	*8.75@ 9.25*	8.75@ 9.25
Egg	Philadelphia	2.39	‡	‡	9.00@ 9.50	9.00@ 9.15	9.00@ 9.50	9.00@ 9.15
Egg	Chicago*	5.06	$9.50@10.00	8.03@ 8.25	8.14	8.13	8.14	8.13
Stove	New York	2.34	‡	9.15@ 9.40	9.75@10.25	9.25@ 9.50	*9.50@10.25*	9.25@ 9.50
Stove	Philadelphia	2.39	‡	‡	9.75@10.20	9.35@ 9.50	9.75@10.20	9.35@ 9.50
Stove	Chicago*	5.06	10.00@11.00	8.48@ 8.80	8.70	8.33@ 8.58	8.70	8.33@ 8.58
Chestnut	New York	2.34	‡	8.65@ 8.95	9.50@10.00	8.75@ 9.15	*9.25@ 9.85*	8.75@ 9.15
Chestnut	Philadelphia	2.39	‡	‡	9.25@10.00	9.00@ 9.15	9.25@10.00	9.00@ 9.15
Chestnut	Chicago*	5.06	10.00@11.00	8.50@ 8.75	8.39	8.33@ 8.53	8.39	8.33@ 8.53
Pea	New York	2.22	‡	5.00@ 6.25	6.00@ 6.50	6.00@ 6.50	6.00@ 6.50	6.00@ 6.50
Pea	Philadelphia	2.14	‡	‡	6.30@ 6.75	6.00@ 6.50	6.30@ 6.75	6.00@ 6.50
Pea	Chicago*	4.79	5.50@ 6.00	5.50@ 6.00	6.03	6.10	6.03	6.10
Buckwheat No. 1	New York	2.22	‡	2.50@ 2.75	2.50@ 2.75	2.50@ 3.50	*2.35@ 2.75*	2.50@ 3.50
Buckwheat No. 1	Philadelphia	2.14	‡	2.50@ 3.00	2.40@ 2.75	2.50@ 3.00	2.40@ 2.75	2.50@ 3.00
Rice	New York	2.22	‡	2.25	1.50@ 1.75	2.00@ 2.25	1.50@ 1.75	2.00@ 2.25
Rice	Philadelphia	2.14	‡	‡	1.90@ 2.00	1.75@ 2.25	1.90@ 2.00	1.75@ 2.25
Barley	New York	2.22	‡	2.25	1.25@ 1.50	1.50@ 1.75	1.25@ 1.50	1.50@ 1.75
Barley	Philadelphia	2.14	‡	‡	1.75	1.50@ 1.75	1.75	1.50@ 1.75
Birdeye	New York	2.22	‡	‡	1.35@ 1.60	2.00	1.35@ 1.60	2.00

*Net tons, f. o. b. mines. †Advances over previous week shown in **heavy type**; declines in *italics*.
‡Quotations withdrawn because of strike which started Sept. 1, 1925.



An undercurrent of uneasiness characterized the Louisville market in Kentuck coal last week. Advances were checked and sales at the "stabilized" basis were less easy. Eastern Kentucky block was $5@$6; 2-in. lump, egg and nut, $4.75@$5.25; mine-run, $3.75@$4.50; slack, $3.25@$3.75. Western Kentucky block, 4-in lump and egg were $3.50@$4.25; nut, $2.25@$2.75; mine-run, $1.65@$2.25; screenings, $1.40@$2.

British Rumors Affect Kentucky

Kentucky operators were much interested in the news coming out of London. With lake trade practically over, they feel that the collapse of the British strike will lead to a bad break in the American coal market. The car-supply outlook continues disturbing, but production as a whole is well maintained. Recent increases in wages in the eastern part of the state are expected to attract more labor to the mines although producers are not sanguine that this will mean much of a gain in output.

Last week witnessed further increases in prices at the Head of the Lakes. These advances, ranging from 25 to 75c., pushed Pocahontas mine-run to $6; screenings, $5; Youghiogheny, Hocking and splint lump, egg and stove, $6; all bituminous screenings, $5. Briquets have been advanced 50c. to $9.50. Domestic coke holds at $8.50 and there has been no change in anthracite prices. Demand for hard coal, however, is extremely active and much of the business that was drifting to West Virginia smokeless has been recaptured.

Dock Shipments Near Record

October shipments from the docks totaled 30,993 cars—the highest figure reached this year, but 692 cars under peak monthly loading in 1925. November also probably will show up well, as all docks have been operating to capacity. Under the spur of rising prices retail distributors and industrial consumers have been rushing in orders in the hope of covering on their favorite coals before the dock supplies are exhausted. October dock receipts were 901,003 tons of bituminous and 105,759 tons of anthracite. To Nov. 1 the season's receipts of hard coal were 314,614 tons ahead of last year, and of soft coal, 465,829 tons.

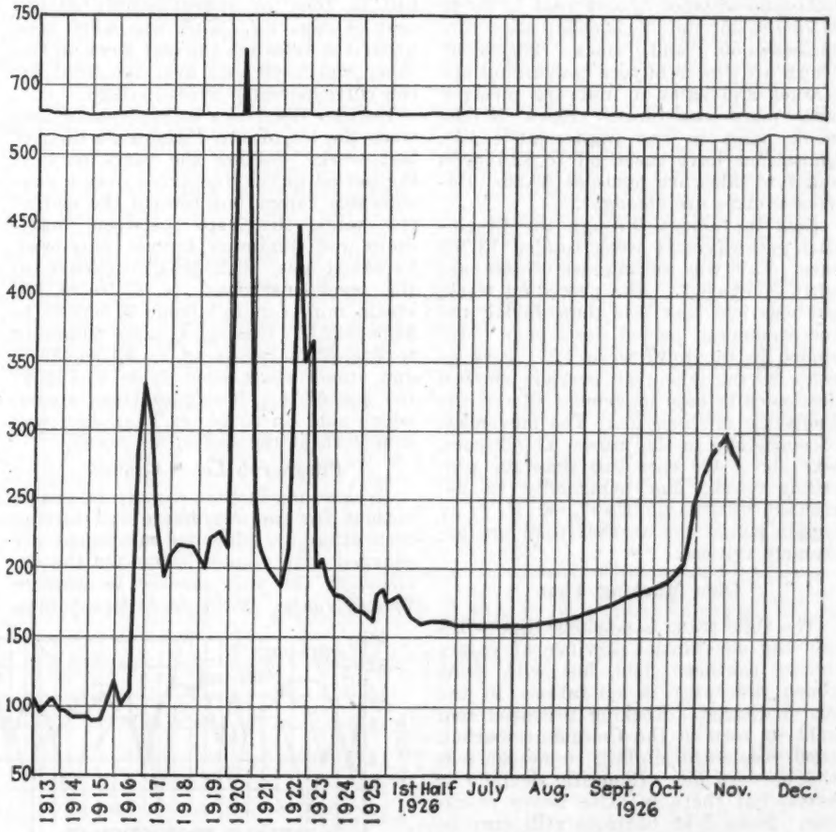
Trade has been steady at the Twin Cities. Retail consumers are buying to meet weather needs. Industrial purchasing agents have given up any immediate hope of "bearing" the market. Milwaukee wholesalers are receiving additional lake tonnage in the face of strong Eastern and export demand. Current prices, however, are holding back storage orders. This in turn threatens congestion at the docks at a time when operators are anxious to unload all the coal they can buy from their Eastern connections. Milwaukee retail coke prices are up $1.

A stronger tone to screenings was the outstanding feature of the Southwestern market the fore part of the month. Lessening of pressure from Illinois and western Kentucky put the Kansas operators in a more favorable position. Although the circular on slack was unchanged at $2.35, concessions no longer were offered to effect sales. Inadequate car supply in the southern Kansas area also was a factor of strength. Retail demand is improving, but mine prices on prepared sizes from Kansas, Arkansas, Oklahoma and Missouri are unchanged.

Cold weather came to the relief of the Colorado operators the first week in November and reduced the accumulation of "no bills" which had been piling up under springlike skies. Mines are averaging 70 per cent of capacity, but have felt none of the pressure characterizing recent trading east of the Mississippi River. Utah business on the whole is lagging. At the beginning of the month there were over 400 "no bills" on track and operators were threatened with an uncomfortable surplus of slack coal.

Readjustments at Cincinnati

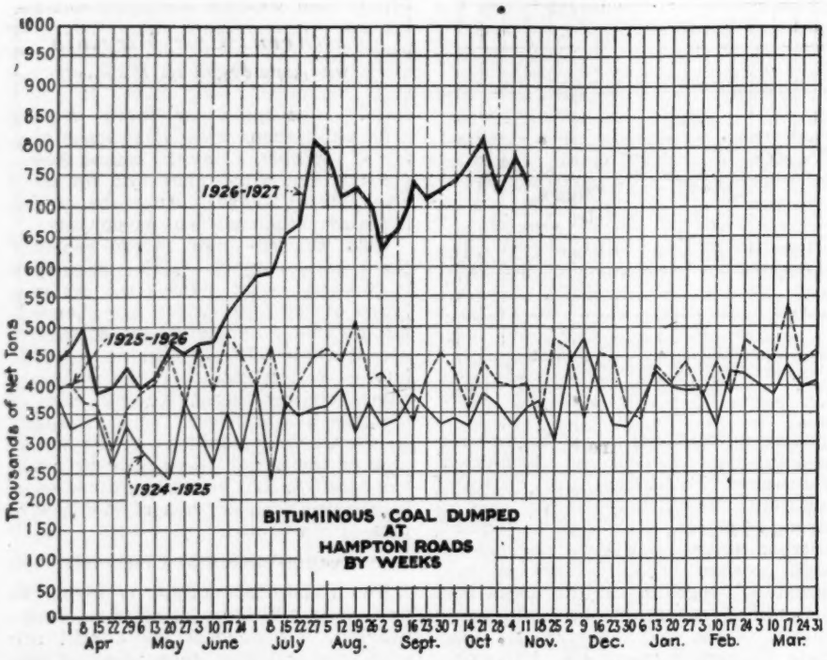
The Cincinnati market is trying to find itself. Wildcat prices are disappearing, but general levels still are considerably higher than was the case a few months ago. The tidewater situation remains the controlling factor. Heavier demand inland, however, robs the seaboard movement of some of its snap. The effect of the general in-



Coal Age Index of Spot Prices of Bituminous Coal F.O.B. Mines

	1926				1925	1924
	Nov. 15	Nov. 8	Nov. 1	Oct. 25	Nov. 16	Nov. 17
Index	275	299	285	249	190	170
Weighted average price	$3.32	$3.61	$3.45	$3.02	$2.30	$2.06

This diagram shows the relative, not the actual, price on fourteen coals, representative of nearly 90 per cent of the bituminous output of the United States, weighted first with respect to the proportions each of slack, prepared and run-of-mine normally shipped, and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke: 1913-1918," published by the Geological Survey and the War Industries Board.



crease in wages throughout the non-union fields of the South is attracting much attention.

Smokeless lump and egg have settled down to $5@$5.75 on contract and $5.50@$6 on spot. Stove coal is up to $4.75@$5.25; nut, $4.50@$5; mine-run, $3.75@$4.50, and slack, $3@$3.50. There are fewer buyers canvassing the market and sales of nut are meeting with more resistance. Slack is the weak point in the high-volatile list. Quotations have eased off to $2.75@$3 and few sales are made at $3.25. Domestic sizes are stronger.

Coal movement through the Cincinnati gateway last week totaled 13,768 cars. This was an increase of 403 cars when compared to the preceding week, but was 590 cars less than during the corresponding period last year. Included in the total were 1,271 cars en route to the lakes; all carriers showed decreases in lake movement except the Louisville & Nashville. The movement of open-tops to the mines, 11,932 cars, was about 400 cars less than the preceding week, due principally to decreased returns to the L. & N. Car supply conditions on that road are extremely critical.

Ohio Marking Time

The Ohio trade is marking time without any substantial sacrifice of values in the southern field, but with some sharp decreases in quotations in the No. 8 district. Hocking prepared coal held its own in the Columbus market, slack weakened slightly; mine-run was the hardest hit. Domestic demand is brisk, but there is little heavy stocking. Some lake business still may be picked up; general industrial buying, however, again has quieted down after a feverish fortnight. Considerable unpleasantness has developed over the status of a number of steam-coal contracts.

Purchasing agents placing orders in the Cleveland market held back for lower prices last week. Despite the breaks in all grades of No. 8 coal, however, there was little evidence that steam plants were scrambling to take advantage of the tonnage thrown on the market at reduced prices. Production during the week ended Nov. 6 was 340,000 tons, or approximately 49 per cent of capacity. This was 4,000 tons under the total for the last week in October and 8,000 tons over the total for the corresponding week in 1925.

Further decreases in spot quotations were the lot of the Pittsburgh district last week. During the early part of the period prices fluctuated over a considerable range, but toward the end of the week the gaps between maximum and minimum figures narrowed. Screened gas, $3.25@$3.75 earlier in the week, narrowed to $3.50@$3.60; steam mine-run fell from $2.50@$3 to $2.50@$2.60. Gas slack, after tumbling to $2@$2.25 recovered to $2.30@$2.40 and steam slack went from $1.75@$2 to $2@$2.15. Three-quarter steam, which sold up to $4 on Thursday, was $3@$3.25 at the end of the week.

Pittsburgh Loses Ground

Heavier production, a more favorable outlook for the consumers and further restrictions in tidewater movement are charged with responsibility for the declines in the spot market in western Pennsylvania. News from Great Britain was a talking point rather than an actual influence. A three-day flat embargo on eastbound Baltimore & Ohio movement, which has been under the permit system since Oct. 18, contributed to the softness. Car supply is tight in the Pittsburgh district, but no real shortages have been reported.

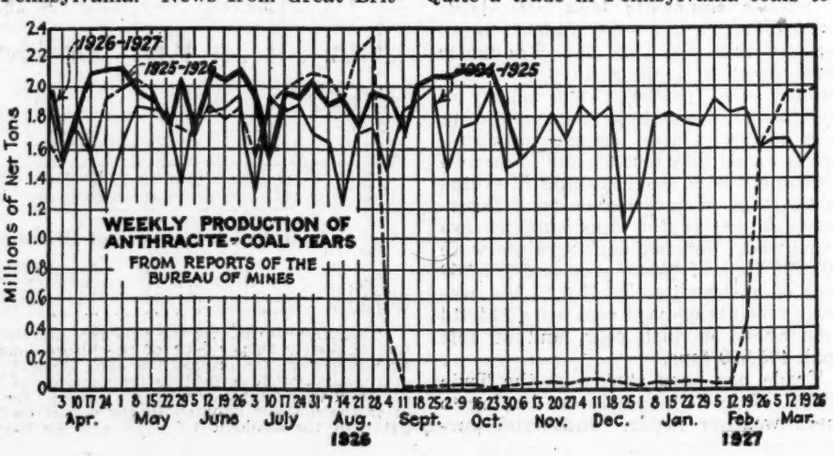
A drop of 25c. in all pool prices marked the reaction of central Pennsylvania to the reports of the pending settlement of the British strike. Pools 1, 9 and 71 were $3.75@$4.25; pool 10, $3.25@$3.75; pool 11, $3@$3.25; pool 18, $3. The decline in prices, however, did not appear to have any effect upon shipments and an active winter trade is predicted regardless of how soon the British miners return to full-time production.

Most of the distress tonnage at Buffalo has been cleaned up. Current quotations, however, have declined 50c. to $1.25 per ton on offerings of high-volatile coal. The disposition to stay out of the market as long as possible still is strong. Youghiogheny gas lump was quoted at $4@$4.50 last week; slack, $2.50@$3; Pittsburgh and No. 8 steam lump, $3@$3.50; slack, $2@$2.50; Allegheny Valley mine-run, $3@$3.50; Fairmont lump, $3@$3.25; mine-run, $2.25@$2.75; slack, $2@$2.25. Low-volatile prepared ranges from a minimum of $3.25 on Indiana lump to a maximum of $5.50 on Pocahontas, with mine-run from $2.25 to $4.

Northeast Swings on Cable News

The New England spot market still is active, with quotations fluctuating with the cabled reports of British strike settlement negotiations. On the whole, however, prices have been working lower. Deserted by the buyers for several days, the market in both tide and all-rail coals sagged heavily, only to recover somewhat as British negotiations dragged and local interests were forced to order tonnage to take care of immediate requirements.

At Hampton Roads sales have been reported all the way from $8.75 to $9.75, but there is very little free Navy Standard to be had at the Virginia piers. Most of the higher grades of central Pennsylvania coals are booked ahead for some weeks to come; current spot offerings all-rail generally are pool 10 classification or lower-rated pools, bringing $3@$3.75 net at the mines. Pocahontas and New River are offered on cars at Boston at $9.50@$10.50. Quite a trade in Pennsylvania coals to



Car Loadings and Supply

	Cars All Cars	Loaded Coal Cars
Week ended Nov. 6, 1926.....	1,137,210	227,574
Week ended Oct 30, 1926.....	1,216,432	236,776
Week ended Nov. 7, 1925.....	1,063,332	189,212
Week ended Oct. 31, 1925.....	1,091,273	194,255

	Surplus Cars All Cars	Surplus Cars Coal Cars	Car Shortages All Cars	Car Shortages Coal Cars
Oct. 31, 1926..	81,011	12,106	.....	.....
Oct. 22, 1926..	79,016	13,997	.....	.....
Oct. 31, 1925..	111,619	42,949	.....	.....

replace West Virginia fuel has developed.

The New York bituminous market was uneven last week. A slump the fore part of the period was followed by a partial recovery, but quotations at the end of the week were 50c. to $1.25 under those prevailing the preceding week. Congestion and embargoes at Baltimore and Philadelphia diverted tonnage to the New York piers and helped the downward trend. Local and inland buyers were less eager to take on tonnage. Broad Top was offered at $4; Ligionier, $2.75; Georges Creek, $2.90.

Embargoes Wreck Price Structure

The embargoes at Philadelphia played hob with prices and sent quotations down $1@$1.50. Holiday layoffs intervened, however, and brought back low-volatile pier figures to within 10 to 50c. of the quotations for the preceding week. High-volatile quotations showed a net loss of 75 to 95c. While the embargo hit prices it had no effect upon the rate of buying; orders continue to roll in and an active market through the rest of the coal year is predicted. Local car shortages are reported from various parts of the Pennsylvania mining field.

Declines of 75c. to $1.25 measured the reaction of the Baltimore market to reports that the British strike was about to end. Purchasing agents still cling to the hope that the bottom will drop out of the export market soon enough to save the domestic market from any sharp increases in fuel costs. At the present, however, there are no signs of an early falling off in overseas movement. Last month Baltimore loaded 1,066,833 gross tons of coal for foreign destinations, and November promises well.

The British strike situation and the waning lake trade called time on price advances at Hampton Roads last week. High-volatile coals were really more in demand than low-volatile coals and topped the latter in prices at the piers. Slack was particularly tight. All the piers are working 24 hours a day, but the terminals still are badly congested.

Birmingham District Active

The Birmingham district last week was still swimming along on the backwash of the swift current of Eastern demand. Spot buyers were begging for shipments, with prices and quality secondary factors. There is little high- or medium-grade fuel to be had and cheaper coals are enjoying a much wider market. Export and bunker inquiries and bookings are heavier and it is estimated that 200,000 tons additional will soon be moving to foreign consumers. Retail stocks are low and shortsighted dealers are clamoring for deliveries.

Advances of 25 to 75c. have been made in some of the mine quotations since the last report. The list now stands: Big Seam mine-run, $2@$2.25; washed, $2.25@$2.50; lump, $3; Carbon Hill mine-run, $2@$2.25; washed, $2.50 @$2.75; lump, $3.50@$4; Cahaba washed, $2.75@$3.50; lump, $5.25@ $6.50; Black Creek washed, $3.60@ $3.75; lump, $5.25@$6.50; Corona mine-run, $2.75; washed, $3; lump, $4; Pratt mine-run and washed, $2.50@$3; Montevallo lump, $6@$7.

Domestic anthracite is moving freely in the New York market, following an incipient slump which took the edge off independent quotations. No. 1 buckwheat also weakened slightly. Rice and barley are slow but steady. Pea is in fair shape; egg is long; nut is a close second to stove in popular favor. At Philadelphia conditions are closely parallel to those in New York. If anything, actual movement is slower. Chestnut, too, is less active than in the New York market and pea more quiet. Steam sizes hold their own.

Weather Demand in Anthracite

Anthracite is enjoying a seasonal demand at Baltimore, with stocks ample to meet orders. Buffalo reports characterize local trade there as "fair, but not what it should be, considering the time of the year." Lake trade shows little change. During the week ended Nov. 11 dumpings at Buffalo were 54,100 net tons, of which 24,800 tons were cleared for Milwaukee, 24,000 tons for Duluth and Superior and 5,300 tons for Fort William.

Spot Coke Buying Light

Coke prices in the Connellsville region have declined only slightly in the past week, first, because advances have been moderate when compared to recent increases in raw coal quotations, and, second, because production has been restricted to release more coal to the market. Buying in the spot coke market is unusually light, but so, too, are the offerings of free coke. Buying for domestic purposes has eased off. Domestic coke is now held at $4.25@$4.50; furnace, $4.75@$5; foundry, $6@$6.50—declines of 25 to 50c. Valley furnaces have been balked by the buyers in the $1 boost in pig iron prices.

Beehive coke production in the Connellsville and Lower Connellsville region during the week ended Nov. 6 was 139,500 tons, according to the Connellsville *Courier*. Merchant-oven output was 71,100 tons, a decrease of 5,570 tons when compared to the output during the preceding week. Furnace-oven output was 68,400 tons, a decrease of 300 tons.

Northern West Virginia Shatters Output Record

Coal mines of northern West Virginia shipped 2,757 car loads of coal on Nov. 8, which established a new record for that field for all time. Not even during the war period was such an output ever reached. The new record represented the output of 290 open-shop and two union mines, the latter produced 39 cars of coal. Loadings were heaviest on the Monongah division of the Baltimore & Ohio, amounting to 1,416 cars. On the Monongahela and Scott's Run railroads a total of 775 cars was loaded. Cumberland division mines alone produced 223 cars of coal and on the Helen's Run and Bingamon branches of the Western Maryland there was an output of 169 cars.

Bituminous Coal Loaded Into Vessels at Lake Erie Ports During Season to End of October

(In Net Tons)

Ports	Railroads	1926 Cargo	1926 Fuel	1926 Total	1925 Cargo	1925 Fuel	1925 Total	1924 Cargo	1924 Fuel	1924 Total
Toledo	Hocking Valley	6,456,328	186,937	6,643,265	7,076,911	204,558	7,281,469	5,678,951	166,444	5,845,395
	Big Four	1,638,931	9,046	1,647,977	1,355,493	7,809	1,363,302	48,746	95	48,841
	N. Y. C.-Ohio Central Lines	1,853,093	96,799	1,949,892	874,044	66,904	940,948	70,043	2,795	72,838
	Baltimore & Ohio	2,243,741	64,742	2,308,483	2,825,528	84,769	2,910,297	1,790,827	54,773	1,845,600
Sandusky	Pennsylvania	5,965,754	173,948	6,139,702	5,155,413	154,313	5,309,726	3,565,883	108,030	3,673,913
Huron	Wheeling & Lake Erie	505,647	28,852	534,499	610,706	31,285	641,991	690,675	32,603	723,278
Lorain	Baltimore & Ohio	1,658,315	126,414	1,784,729	1,212,417	134,060	1,346,477	1,830,823	140,255	1,971,078
Cleveland	Pennsylvania	393,335	156,440	549,775	336,838	154,324	491,162	1,333,028	166,168	1,499,196
	Erie	0	0	0	18,138	1,252	19,390	299,438	10,271	309,709
Fairport	Baltimore & Ohio	600,263	78,947	679,210	788,462	98,010	886,472	491,288	79,692	570,980
Ashtabula	New York Central	191,844	98,208	290,052	314,233	75,965	390,198	771,011	106,611	877,622
	Pennsylvania	810,071	66,822	876,893	664,144	79,630	743,774	1,023,545	71,712	1,095,257
Conneaut	Bessemer & Lake Erie	1,661,827	236,509	1,898,336	1,064,204	198,465	1,262,669	1,430,386	188,575	1,618,961
Erie	Pennsylvania	416,140	77,557	493,697	265,933	52,274	318,207	584,639	75,862	660,501
Total		24,395,289	1,401,221	25,796,510	22,562,464	1,343,618	23,906,082	19,609,283	1,203,886	20,813,169
Storage Loading		*60,142	774	60,916	*33,017	1,048	34,065	*182,060	4,940	187,000

* Coal loaded into vessels in December of previous year, after close of navigation, and forwarded from Lake Erie ports during year indicated.
Compiled by Ore & Coal Exchange, Cleveland, Ohio; H. M. Griggs, Manager.

Foreign Market And Export News

Foreign Coal Buyers Carry On Despite British Strike

Although many European countries are alarmed over the winter outlook in coal, late reports from various quarters of the globe indicate that consumers are carrying on with little suffering despite the prolonged tie-up at the British mines and the forced elimination of the greatest coal exporting nation from the fuel markets of the world.

Increased production in Germany, Belgium, France, the Netherlands, Poland, Czechoslovakia and Russia is playing the leading part in tiding Continental Europe over the critical situation. In Austria, according to a cable from Vienna, industrialists and coal operators have entered into a long-term agreement to use the low-grade fuel found in that country. Industrial consumers are planning alterations in their plants to adapt them to this fuel.

While the United States has been drawn upon for upward of 1,500,000 tons monthly to eke out the coal supply of Great Britain, American exporters have had only a minor rôle in fueling Continental Europe. In South America, however, American coal has largely replaced the British product. The United States also is shipping to Africa. Asia is well supplied with native coal, but political disturbances in China threaten native coal production and shipment.

Germany is one of the principal beneficiaries of the British strike. September production was 12,800,000 metric tons and exports were 3,700,000 tons. Included in this movement were shipments of 12,500 tons to the United States. Imports during the month approximated 1,300,000 tons. More American coal is arriving in France and some small contracts have been closed with Paris gas works and the state railways.

September production in the Netherlands was 770,000 metric tons and imports 1,022,000 tons of which 1,000,000 tons came from Germany. Exports totaled 871,000 tons, including 278,000 tons to England and 166,000 tons to Belgium. Prices are rising and stocks falling in the latter country although pressure has been put upon production. The Italian situation is serious. Some industries have curtailed operations because of high prices.

Nearly 80 per cent of the coal imported into Argentina is now coming from the United States. Brazil imports are subnormal and one railroad has been compelled to reduce its service. The Chilean mines at Lebu have been closed down. Scarcity of bottoms is hampering imports. Australian coal is quoted at 40s.@42s., c.i.f. the Nitrate ports; American coal, 40s.; Chilean, 80 pesos ($9.70).

Export Movement Keeps Up

Bituminous coal exports from Atlantic ports of the United States during the week ended Nov. 6 totaled 633,173 gross tons, according to figures supplied to the Coal Division of the Department of Commerce by customs officials. Exports from the separate ports, are as follows: New York, 23,146 tons; Philadelphia, 100,439 tons; Baltimore, 267,974 tons; Norfolk, 226,014 tons; Charleston, 15,600 tons.

Export Clearances, Week Ended Nov. 11

FROM HAMPTON ROADS

	Tons
For United Kingdom:	
Fr. Str. Aurillac	6,268
Br. Str. Maplegrove	5,195
Grk. Str. Georgios	5,993
Grk. Str. Zannis L. Cambanis	6,543
Br. Str. Carlton	7,514
Br. Str. Ardenhall	6,896
Br. Str. Glamorganshire	9,640
Br. Str. Maresfield	6,009
Br. Str. Mongolian Prince	7,572
Span. Str. Gloria	2,980
Br. Str. Burdale	6,214
Br. Str. Johnstown	3,284
Br. Str. Pencarrow	7,078
Br. Str. Sheafcrest	3,478
Br. Str. Tremeadow	6,744
Grk. Str. Elin	6,908
Br. Str. Royal City	7,998
Span. Str. Mari	5,751
Ital. Str. Andalusia	6,137
Grk. Str. Emmanuel Stravandis	6,687
J.-S. Str. Rudnik	5,180
Br. Str. Zimorodak	5,316
Br. Str. Wotan	5,162
Br. Str. Blairgowrie	5,018
Br. Str. Aldsworth	4,520
For England:	
Ger. Str. Ellbek, for Lands End	3,146
Nor. Str. Burgos, for London	3,909
For Scotland:	
Br. Str. Massilia, for Glasgow	6,000
For Denmark:	
Nor. Str. Navarra, for Copenhagen. For Newfoundland:	2,709
Br. Str. Ashworth, for Botwoodsville For Ireland:	7,235
Swed. Str. Ad Gorthon, for Dublin. For Italy:	3,492
Ger. Str. Ditman Koel, for Genoa. For Argentine:	7,882
Br. Str. Queensland Transport, for Buenos Aires	6,180
Fr. Str. Martinere, for Buenos Aires. For Trinidad:	3,903
Nor. Str. Bessegen, for Port of Spain For British West Indies:	4,304
Amer. Schr. Augusta W. Snow, for Besse Terre For Wales:	943
Span. Str. Mar Del Norte, for Swansea	3,237
Dan. Str. Sonderborg, for Cardiff. For France:	4,016
Br. Str. Aylesbury, for Marseilles	4,524
Amer. Str. Oakley L. Alexander, for Havre For Brazil:	7,088
Br. Str. Aboukir, for Ceará	3,498
For Egypt:	
Gr. Str. Vassilios, for Port Said	4,195
Br. Str. Essex Envoy, for Port Said	6,840

FROM BALTIMORE

For England (to Queenstown for orders unless otherwise specified):	
Br. Str. Millpool	5,860
Br. Str. Hallmoor	5,055
Br. Str. Maine	8,272
Br. Str. Seapool	6,788
Br. Str. Invella	7,463
Br. Str. Scotland Maru	7,250
Br. Str. Gongenheim	7,001
Ger. Str. Karpfanger, for Barry Roads for orders	8,387
J.-S. Str. Marija Racic	6,119
Br. Str. Orari	7,625
Dan. Str. Yokohama	4,268
Ital. Str. Clara Camus	7,924
Grk. Str. Meropi	5,793
Br. Str. Kayak	5,223
Ital. Str. Volturno, for Lands End for orders	6,996
Swed. Str. Nuolja	9,968
Ital. Str. Goffredo Manieli	5,693
Grk. Str. Nicholas Zafirakis, for Lands End for orders	5,240
Span. Str. Kauldi	4,642
Span. Str. Conde De Abasolo	4,329
Br. Str. Luciston	7,504
Span. Str. Bachi	4,670
Span. Str. Arno Mendi	6,843
Br. Str. Anglo Mexican	6,811
Ital. Str. Aster, for Lands End for orders	8,996
Am. Str. Nebraskan	6,602
Br. Str. Geddington Court, for Manchester	6,633
J.-S. Str. Nemanja	6,993
Grk. Str. Elisavet	5,505
Ital. Str. Ansaldo Secondo	6,214
For Italy:	
Am. Str. Sucarseco, for Genoa	4,392
Jap. Str. Victorio Maru, for Savona	7,260
Ital. Str. Ida, for Venice	3,521
For Argentine:	
Br. Str. Parktown, for Rosario	5,253
Port. Str. Maria Christina, for Rosario	4,195
For Morocco:	
Br. Str. Mountpark, for Casa Blanca	3,440
For Egypt:	
Br. Str. Putney, for Alexandria	4,717
For Ireland:	
Br. Str. Kingsbury, for Dublin	5,598
For France:	
Ital. Str. San Giuseppi, for Havre	7,037
For Brazil:	
Am. Schr. Thann, for Rio Janeiro	3,495
For Sweden:	
Dan. Str. Kronborg, for Gothenburg	4,488

FROM PHILADELPHIA

For United Kingdom:	
Br. Strs. Homer City, Plow City, Charterhulme, Coastworth, Bellview, Clintonia, Arundale and Astoria, Du. Str. Wassenaar, Grk. Str. Alexandros, Ital. Strs. Messicano, Concordia and Mediterranee	——
For Spain:	
Nor. Str. Hellen, for Barcelona	——
For Sweden:	
Swed. Str. Liguria, for Oslo	——
Nor. Str. John Blumer, for Oslo	——
For Martinique:	
Am. Schr. Eileen Little, for Francois Bay	——
For Cape Verde Islands:	
Ital. Str. Gerty, for Las Palmas	——
For British West Indies:	
Br. Str. Gulke, for Antigua	——
For Denmark:	
Nor. Str. Erle, for Copenhagen	——
For Brazil:	
Du. Str. J. W. Van Dyke, for Rio Janeiro	——
Br. Str. Merioneth, for Rio Janeiro.	——
Br. Str. Trevalgan, for Santos	——
Br. Str. Commercial Guide, for Rio Janeiro	——
For Gibraltar:	
Br. Str. Snowden	——
For Portugal:	
Br. Str. Briarpark, for Lisbon	——
For Norway:	
Nor. Str. Jessie, for Saresborg	——

Hampton Roads Coal Dumpings*

(In Gross Tons)

	Nov 4	Nov. 11
N. & W. Piers, Lamberts Pt.:		
Tons dumped for week	276,952	256,125
Virginian Piers, Sewalls Pt.:		
Tons dumped for week	158,452	166,774
C. & O. Piers, Newport News:		
Tons dumped for week	264,162	236,358

* Data on cars on hand, tonnage on hand and tonnage waiting withheld due to shippers' protest.

Pier and Bunker Prices, Gross Tons

PIERS

	Nov. 4	Nov. 11†
Pool 1, New York	$7.50@$8.00	*$7.00@$7.25*
Pool 9, New York	7.15@ 7.50	*6.50@ 6.75*
Pool 10, New York	7.00@ 7.25	*6.20@ 6.55*
Pool 11, New York	6.75@ 7.00	*6.00@ 6.35*
Pool 9, Philadelphia	7.20@ 7.40	7.20@ 7.40
Pool 10, Philadelphia	7.05@ 7.25	7.05@ 7.25
Pool 11, Philadelphia	6.65@ 6.90	6.65@ 6.90
Pool 1, Hamp. Roads	9.50@10.00	*8.50@ 8.75*
Pool 2, Hamp. Roads	9.00@ 9.50	*8.00@ 8.25*
Pool 3, Hamp. Roads	7.50@ 8.00	*7.00@ 7.50*
Pools 5-6-7, Hamp. Rds.	10.00@12.00	*9.00*

BUNKERS

Pool 1, New York	$7.75@$8.25	*$7.25@$7.50*
Pool 9, New York	7.40@ 7.75	*6.75@ 7.00*
Pool 10, New York	7.25@ 7.50	*6.45@ 6.80*
Pool 11, New York	7.00@ 7.25	*6.25@ 6.60*
Pool 9, Philadelphia	7.45@ 7.65	7.45@ 7.65
Pool 10, Philadelphia	7.25@ 7.50	7.25@ 7.50
Pool 11, Philadelphia	6.90@ 7.20	6.90@ 7.20
Pool 1, Hamp. Roads	9.50@10.50	*8.50@ 8.75*
Pool 2, Hamp. Roads	9.00@ 9.50	*8.00@ 8.25*
Pools 5-6-7, Hamp. Rds.	10.00@12.00	*9.00*

†Advances over previous week shown in **heavy type**; declines in *italics*.

Coming Meetings

Southern Appalachian Coal Operators' Association. Annual meeting, Nov. 19, at Knoxville, Tenn. Secretary, R. E. Howe, Suite 1306, General Building, Knoxville, Tenn.

American Society of Mechanical Engineers. Annual meeting, Engineering Societies Building, 29 W. 39th St., New York City, Dec. 6-9. Secretary, Calvin W. Rice, 29 W. 39th St., New York City.

American Mining Congress. Annual meeting, Washington, D. C., Dec. 7-10, Hotel Mayflower. Secretary, J. F. Callbreath, Munsey Bldg., Washington, D. C.

Coal Mining Institute of America. Annual meeting, Chamber of Commerce, Pittsburgh, Pa., Dec. 8, 9 and 10. Secretary, H. D. Mason, Jr., Box 604, Ebensburg, Pa.

Smokeless Coal Operators' Association of West Virginia. Annual meeting Dec. 9, at Washington, D. C. (tentative) Secretary, E. J. McVann, Insurance Bldg., Washington, D. C.

Coal Operators' Association of the Thick Vein Freeport Seam of Pennsylvania. Annual meeting Dec. 14, at Pittsburgh, Pa. Secretary, C. W. Gibbs, Pittsburgh, Pa.

Lehigh Valley Section, American Institute of Electrical Engineers. Annual meeting, Nov. 12, Schuylkill Country Club, Pottsville, Pa.

New Companies

The Jennie B. Coal Co., Clarksburg, W. Va., has just been organized with a capital stock of $10,000. This company will engage in the mining and shipping of coal. Incorporators are Helen E. Bush, Buenna Orr Pickens, Mary E. Shattleworth, Lucile C. Rexroad and M. A. Whalen, all of Clarksburg.

The Sixth Vein Coal Co., Madisonville, Ky., capital $20,000, has been chartered by W. E. Carroll, Tom Logan and H. H. Coil. It will be an operating company and the mine now being developed will have an output of 700 to 800 tons daily.

The Coalspur Collieries, Ltd., has been incorporated with head office at Edmonton, Alberta, with a capital stock of $300,000, by William R. Alger, Harold Lawrence Howe, Frederick W. Barclay, and others.

Articles of incorporation have been filed by the **Dominion Mines Co.**, of Terre Haute, Ind. The company has a capital stock of 7,500 shares of no par value and will mine coal and other minerals. The incorporators are A. J. Beasley, L. M. Springer and H. Derby.

Articles of incorporation have been filed by the **Twin States Mining Co.** at Terre Haute, Ind. The company has a capital stock of 2,500 shares of no par value and $50,000 of preferred stock and will do a general mining business. The incorporators are Charles A. Crawford, George D. Yeazel and James W. Coston, all of Terre Haute.

New Equipment

Mycalex—A New and Unique Insulating Material

A new type of insulating material which is being used by the General Electric Co. for the production of radio high-frequency insulators not only solves the problem of an improved insulator for such high frequencies as are encountered in radio work but also solves a problem in more efficient utilization of materials. The new insulation, known as Mycalex, is a composition of ground mica and lead borate.

Mica previously presented a difficult problem because of the enormous amount of waste. Obtained in Canada and India in large sheets, there was considerable waste at the mines, it being estimated that only 5 per cent of the material taken from the mines could be used. In manufacturing, there were further wastes of small pieces of mica, but some years ago it was found that these mica flakes, mixed with a binding material and compressed under heat, made very good insulation. Such sheets of prepared mica are used by the General Electric Co. in many manufacturing processes. And now a product has been developed which utilizes mica particles, so that even more of the mineral is used.

BETTER INSULATION

The new material has better insulating properties than has porcelain, and several applications for it have been developed by engineers of the company. The substance, light gray in color and with a metallic ring, is being used in the manufacture of bases for radio transmitter tubes, for aërial insulators in high-frequency work, and for numerous similar applications.

Chief among its characteristics are that metal parts may be inserted or combined with Mycalex during the process of molding; and although a hard and stone-like product, it can be subjected to ordinary machining methods.

Mycalex is softened or made plastic by heating to a dull red, and the plastic mass is then formed into the desired shape by compression in steel molds. The substance is not as heat-resistant as porcelain or mica, but tests show that it is far superior in this respect to the ordinary molded insulations made with phenolic resin, shellac, gums, pitches, and similar materials.

The fact that metal parts can be combined with this new insulator during the molding process assures a tighter and stronger combination. As a rule, metal inserts cannot be imbedded in ceramic products during the process of manufacture. This is especially true of porcelain because of the considerable shrinkage and the high temperature, which causes melting or slagging of metal parts.

Not only has it better electrical properties than porcelain, but it is stronger mechanically except under compression. Although it can be drilled, filed, sawed, polished, and similarly treated by usual machining methods, it is necessary in some instances to use special tools, since the wear, when working with Mycalex, is greater than when cutting metals.

The new material has been recommended for use where the requirements demand an insulating material of high mechanical strength, dielectric strength and insulating resistance, low losses with high frequencies, heat resistance beyond the ordinary range of molded or sheet materials, and compact construction with metal inserts securely molded in place.

Vibrating Screen Prepares, Also Conveys Coal

In developing a screen for coal preparation, the Montgomery Coal Washing & Mfg. Co., Birmingham, Ala., has departed, it claims, from other types of coal preparation screens, in that its screen is perfectly flat instead of being inclined. This company builds other types but calls the new one the Conveying Vibrator. When installed it is perfectly level and the material to be screened is automatically fed by the vibration of the screen itself, making it possible, it is stated, to get a uniform amount of material over the vibrator at all times. This material moves rapidly from the intake to the discharge end, and because of the violent vibrations of the screen, perfect separation of all material that will pass through the perforations from larger sizes is assured. The screen will move its load up a 10 per cent pitch with but a slight reduction in capacity.

The screen is simple in construction.

Conveys as Well as Sizes

This screen, setting perfectly level, is fed automatically by its own vibrations, making it possible to get a uniform quantity of material over the perforations at all times. According to the manufacturer the smaller sizes will not be carried over with the larger pieces.

The shaft is mounted in two dust-proof double ball bearings. Connection to the motor is through a flexible coupling, amply protected from dust. A 1-hp. motor is sufficient to run a 4x6-ft. screen. The manufacturer claims that it makes no difference how much weight is put on the screen, the load on the motor remains the same. This table will handle coke and gravel as well as coal.

Boiler Efficiency Tests Are Made Easy

In its development of gas analysis instruments, the Bacharach Industrial Instrument Co., Pittsburgh, Pa., has announced the portable electric CO_2 meter illustrated. The principle of operation is the same as for the permanently installed meter brought out some years ago by this company, which is essentially as follows:

An electric current is caused to flow through two sets of platinum wires arranged in a Wheatstone bridge circuit. One set of these wires is in a metal chamber through which the flue gas is drawn and the other set in a chamber containing air at room temperature. The heat generated in the wires, by the current, is transmitted through the gases to the walls of the chambers, and as the gas containing the CO_2 transmits the heat less readily than the air, the wires in the gas chamber become hotter than those in the air chamber. This causes a corresponding change in resistance which unbalances the circuit and causes a deflection of the galvanometer to an extent depending on the percentage of CO_2 present.

TEMPERATURE DETERMINED

The portable instrument illustrated consists of an indicator on which the percentage of CO_2 or temperature can be read, the bridge zero adjuster *A*, a tumble switch *B*, and the variable resistance *C*, for current adjustment. To set the proper bridge current, the tumble switch *B* is thrown into the upper position; this cuts the indicator into the circuit as an ammeter, and the current is set to the top mark deflection by means of the variable resistor. Three standard dry cells are used as the current source and connected to the two binding posts in the lower left-hand corner of the instrument. When making temperature measurements, the tumble switch *B* is thrown into the lower position, and with any standard thermocouple connected to the lower right-hand terminals the reading is made on the millivolt scale. By means of a millivolt-temperature curve the temperature is determined.

For the analysis of flue gas the tumble switch *B* is thrown into the center position. The gas is sampled by means of a hand aspirator *D*, which draws the gas through a small calcium chloride and cotton filter *E*, which, when not in use, is conveniently held in the cover of the instrument as shown. The outfit can also be arranged to give continuous indications for short periods. The dimensions of the case are 6½x7½x 9 in. and the complete instrument weighs approximately 14½ pounds.

A Surveyor's Manual

A new edition of the C. L. Berger & Sons, Inc., Manual has been issued by the company to mark the beginning of the second half century since the firm was started. The original manual was written by Christian L. Berger, who founded the business in 1871, and for the purpose of answering the many questions and problems arising in the use of surveying and engineering instruments in the field. The subject matter has been carefully prepared and brought to date to make it confirm to the most recent practice in the construction and use of surveying and engineering instruments. The manual has been written in simple language, and no attempt has been made to make it a textbook.

The purpose of this edition is to place in the hands of users of Berger instruments detailed information about the construction, care, and adjustment of surveying instruments, such as would scarcely find place in a textbook. No attempt has been made to treat the subjects in a perfectly logical order.

The book contains 342 pages and numerous illustrations. Binding, paper and printing are excellent. It is sold at $2 per copy. The company's address is Boston, Mass.

Industrial Notes

A. France, Liége, Belgium, inventor of the Rheolaveur process of washing, has been visiting plants in the anthracite region, constructed in accordance with his designs. He returned to Belgium Oct. 23, having completed the sale of his American rights to the American Rheolaveur Co., which from now onward is permitted to beneficiate by that process all minerals and not coal alone, as heretofore.

The offices of the **Thermoid Rubber Co.** have been moved to 248 Chestnut St., Philadelphia, Pa.

Easy to Use; Convenient to Carry

This instrument, by making flue gas tests easy, should promote an interest in the power department. It is a handy piece of equipment for the combustion engineer who needs a light, conveniently handled and accurate instrument.

Trade Literature

Stainless Steel and Stainless Iron. Bethlehem Steel Co., Bethlehem, Pa. Booklet No. 113. Pp. 18; 4½x7 in.; illustrated. Describes the composition, manufacturing facilities, corrosion resistance, etc. The principal applications to which these metals are put and working instructions are included.

Dodge Mfg. Co., Mishawaka, Ind., has issued an 8x10½-in. bulletin composed wholly of double-page illustrations of the machinery it manufactures.

Ball Bearings for Electric Motors. The Fafnir Bearing Co., New Britain, Conn. Pp. 31; 5½x8½ in.; illustrated. Describes the economies effected by ball-bearing equipped motors, their lubrication and maintenance.

Power Transmitting Equipment. Dodge Mfg. Co., Mishawaka, Ind. Second edition. Pp. 307; 5x7 in.; illustrated. This book contains information on practically everything for the transmission of power.

Industrial Heating with Buffalo Unit Heaters. Buffalo Forge Co., Buffalo, N. Y. Catalog No. 466. Pp. 23; 8½x11 in.; illustrated. The various types of heaters are described with suggested applications of each type.

Duplex Automatic High Frequency Telephony. Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. Circular 1677-Ed.4. Pp. 11; 8½x10½ in.; illustrated. Describes the principle of operation and the advantages from this system.

The New M-S-A Rock-Dust Distributor. Mine Safety Appliances Co., Pittsburgh, Pa. Pp. 12; 8x11 in.; illustrated. The essential features of this distributor are given, together with operating data and specifications. The simple design, rugged construction and low upkeep are stressed. The last two pages are devoted to the recommended standard practices proposed by the Sectional Committee of the American Institute of Mining and Metallurgical Engineers for rock-dusting coal mines to prevent coal-dust explosions.

Automatic Arc Welding with Lincoln Stable Arc Automatics. Lincoln Electric Co., Cleveland, Ohio. Form No. 205-A. Pp. 24; 8½x11 in.; illustrated. Describes the principles of operation and gives table of speeds and costs of the automatic electric arc welder.

Crouse-Hinds Co., Syracuse, N. Y., has issued the following bulletins recently: Bulletin No. 2093, describing type MT Safety Switch Condulets, with various styles of hub plates; Folder 43, describing its different types of Plug Receptacles and Safety Switch Condulets.

General Electric Co., Schenectady, N. Y., recently published a 12-pp. 9x12-in. bulletin, GEL-98, illustrating and describing its Motorized Power fitted for every need.

The Timken Roller Bearing Co., Canton, Ohio, has issued a loose-leaf book of 110 pp. containing technical information relative to the application of Timken bearings to automotive and industrial machinery.